CONSUMPTION OF CLAY, HERBS AND ALCOHOL

BY WOMEN OF CHILDBEARING AGE

IN KAMPALA, UGANDA

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CHAPTER I

INTRODUCTION

Maternal risk behaviors may be detrimental to infant health. These behaviors may cause illnesses or defects that cost time and money, decrease quality of life, increase the need for physical assistance, or death (Institute of Medicine, 1990; Mora and Nestel, 2000; U.S. Department of Health and Human Services, 1990). Several studies have examined maternal risk behaviors such as alcohol consumption (Jacobson and Jacobson, 1999), pica (Rainville, 1998; Geissler et al., 1998) use of herbs, (Mabina et al., 1997), and inadequate prenatal care during pregnancy (Sable and Herman, 1997). In developing countries, however, few studies have examined (a) the reasons why women practice these behaviors, (b) the experiences women have when they practice these risky behaviors, (c) women's knowledge regarding the risks these behaviors pose to their lives or the lives of their infants or (d) the health care providers' advice given during antenatal visits.

Problem and Need for the Study

Mothers who consume clay and alcohol are at risk of poor pregnancy outcomes (Institute of Medicine, 1990; U.S Department of Health and Human Services, 1991). Based on ethnographic studies (Wiley and Katz, 1998; Vermeer and Ferrell, 1985; Geissler et al., 1999; Abrahams and Parsons, 1996) and the researcher's experience,

pregnant women in tropical Africa consume alcohol and herbs, and practice geophagy, a form of pica that is widely practiced in African populations of the tropical region.

Women use herbal medicines for various pregnancy-related problems. The consumption of herbal medicines during pregnancy may be associated with both beneficial and adverse effects on the mother and her fetus (Mabina et al., 1997; Mbura et al., 1985).

The consumption of clay and alcohol can deprive the body of important nutrients. Rainville (1998) reported that pica could interfere with iron absorption and replace food intake when non-food substances were taken in large amounts. Alcohol intake may replace food and may result in the loss of nutrients such as thiamin (Levy et al., 2002). This is a concern because pregnancy is a period of rapid growth and development and requires increased intake of various nutrients.

Alcohol is a teratogenic substance in humans (US Department of Human and Health Services, 1990). Alcohol intake by pregnant women may cause fetal alcohol syndrome (FAS). FAS is identified by a cluster of birth anomalies that include growth retardation, facial abnormalities, and central nervous system dysfunction (Abel and Sokol, 1987; Streissguth, 1994). The highest prevalence of FAS recorded in the world was reported in children in South Africa, Western Cape Province (May et al., 2000). The continued existence or perpetuation of abnormalities related to prenatal alcohol exposure are preventable by abstaining from alcohol during pregnancy.

Health Issues in Uganda

Some of the specific conditions in Uganda that increase maternal risk of morbidity and mortality are low income, food deficits, civil strife, inadequate health delivery services, and a high HIV prevalence (Ministry of Health-Uganda, 1999). Maternal and infant mortality are basic health indicators that measure a nation's health status. Maternal mortality rates are much higher in developing than developed countries. In developing countries, there are 480 deaths per 100,000 live births each year, 18 times more than in developed countries (WHO, UNFPA, UNICEF, 1999). In Uganda, maternal mortality due to pregnancy and childbirth is 506 deaths per 100,000 live births (United States Agency for International Development, 2002). Uganda's maternal mortality rate is 67 times higher than the maternal mortality of 7.5 deaths per 100,000 live births in the United States (Centers for Disease Control and Prevention (CDC), 2002A).

The nutritional status of women in Uganda is poor and has been identified as a major health problem (Ministry of Health-Uganda, 1999). A high prevalence of maternal malnutrition may be due to inadequate food intake, excessive workload, closely spaced pregnancies, cultural practices, illness, and low educational status (Uganda National Food and Nutrition Council, 1996). Widespread nutritional anemia, protein energy malnutrition, iodine deficiency, and vitamin A deficiencies were reported to be major public health issues (Ministry of Health-Uganda, 1999). Maternal anemia is one of the leading causes of maternal death (Ministry of Health-Uganda, 1999).

Infant mortality in Uganda is about 13 times higher than the rate of 6.9 deaths per 1,000 live births in the United States (CDC, 2002B). Infant mortality is 91 deaths per 1000 live births (Central Intelligence Agency (CIA) World Fact Book: Uganda, 2002;

Ministry of Health-Uganda, 1999). The Uganda National Food and Nutrition Council (1996) reported that 16% of the infants were born weighing less than 2500 gm (5.5 pounds); in the US the incidence of low birth weight is 11.8% (CDC, 2002B). However, numbers in Uganda could be higher due to inadequate maintenance and reporting of health statistics.

Significance of the Study

Data on the prevalence of consumption of clay, herbs, and alcohol in pregnant women and how the mother's beliefs of these practices relate to pregnancy outcome have not been documented in Uganda. The presence of clay, herbs, or alcohol in the diet of a pregnant woman may compound the problem of malnutrition in Ugandan women. The consumption of these substances may pose a major health problem that needs further investigation in this population (U.S. Agency for International Development, 2002; Ministry of Health-Uganda, 1999). Therefore, there is a need to investigate women's knowledge and beliefs about consumption of soil, herbs, and alcohol during pregnancy. The information could be used to improve prenatal care for pregnant women and lead to improved birth outcomes.

Purpose of the Study

The purpose of the present study was to investigate nutrition-related behaviors that may be associated with poor reproductive performance in pregnant Ugandan women. The selected nutrition and health related issues included consumption of clay, herbs as

medicine, alcohol, and prenatal advice given regarding these behaviors. In particular, the study examined women's

1. beliefs about geophagy, use of herbs, and alcohol consumption during pregnancy,
2. knowledge of the effects of prenatal alcohol consumption on pregnancy outcome,
3. knowledge of the effect of geophagy and use of herbs on pregnancy outcome, and
4. use of clay, herbs, and alcohol while pregnant.

Knowing the extent to which these factors are present in women of childbearing age in Uganda, appropriate intervention strategies can be developed to reduce the number of women who practice these behaviors, improve health, save lives, and several millions of shillings. This study also examined advice given by prenatal health care providers. The examination of health providers' advice identified gaps in messages and could be used to develop appropriate intervention messages.

Definition of Terms

The following are the operational definitions of terms for this study.

Alcohol consumption – reported intake of alcoholic beverages including wine (banana wine or "tonto," palm wine, bamboo wine), beer (millet and maize beer), sugar cane, sugar ferment, distillate ("waragi" or crude gin) or a mixed drink (punch).

Behavior - Any activity that can be observed, recorded, and measured (Crider et al., 1989).

Beliefs – perceptions of factual matters, of what is true or the cognitive aspect of attitudes (Crider et al., 1989; Parraga, 1990).

Bumba – clay that has been kneaded and molded, wrapped in banana fiber, and dried by smoking over a fire.

Clay – a sedimentary material with grains smaller than 0.002 mm in diameter; is stiff and sticky and is used to make bricks, pots, and ceramics (Concise Oxford Dictionary, 1995).

Ganda, Baganda, or Waganda – the largest of the 43 ethnic groups in Uganda (are the Bantu people whose origins are from Central Africa) (Minnesota State University, African Cultures: Ganda Culture, 2002).

Ganda or Luganda – language of the Ganda people (Minnesota State University, African Cultures: Ganda Culture, 2002).

Geophagy, geophagia, geophagous, geophaghism – eating earth (clay or soil)

Herb – any leafy plant without a woody stem used as a remedy (Concise Oxford Dictionary, 1995).

Herb-clay, herbal clay – a mixture of dried clay with ground herbs.

Knowledge – use of the mind, intellectual ability, rational learning (e.g. recalling, remembering and recognizing) (Chamberlain, 1992).

Low birth weight – infant birth weight of less than 2,500 gm (Institute of Medicine, 1990).

Meconium – dark green mucilaginous material in the intestine of full-term infants (Dorland's Pocket Medical Dictionary, 1995).

Mumbwa – clay mixed with ground herbs, kneaded, molded into a tapering sausage shape and sun dried.

Pica – the abnormal craving to eat unusual things such as chalk, hair, baking soda, baby powder, ice, starch, clay or soil (Rainville, 1998; Cooksey, 1995; Edwards et al., 1994; Lacey, 1990; McLoughlin, 1987).

Prenatal care – the examination, assessment, education, and treatment of a pregnant woman provided by health providers.

Vernix caseosa – an unctuous substance composed of sebum and desquamated epithelial cells, which covers the skin of the fetus (Dorland's Pocket Medical Dictionary, 1995; BabyZone, 2002).

Assumptions

The following were the assumptions for this study:

1. The information obtained by interviewing the participants was accurate.
2. The beliefs and knowledge of the participants were reliable and valid.
3. The interviewer biases were minimal or eliminated to increase reliability.

Principal Investigator's Brief Background

The principal investigator was born in the Eastern region of Uganda, grew up, attended and completed primary school and higher education, and worked in Kampala District for several years. Most experiences with clay were during the childbearing years when the investigator observed the consumption and encouragement consumption of clay and herb-clay during pregnancy. Seeing several types of clays sold by vendors on the streets, in the markets of Kampala and at the hospitals entrances, lead to an interest in examining why, when, and how women use these substances. The principal investigator

holds the perspective that health professionals should provide education to change potentially harmful behaviors practiced by pregnant women. Further this education will have a positive effect on the health of pregnant women and their offspring.

Organization of the Dissertation

Chapter I includes the introduction identifying the study problems, the significance of the study, and the purpose of the study. Chapter II contains a review of literature relevant to the study. Chapter III describes the methods used to collect and analyze the data. Chapters IV, V, VI, VII, and VIII are written in manuscript form using the guide for authors for the Journal of Nutrition Education and Behavior. Chapter XI includes a summary of the findings, conclusions, and recommendations of this study.

CHAPTER II

REVIEW OF THE LITERATURE

This literature review focuses on factors associated with pregnancy outcome. This review identified several potentially useful independent variables that pertained to the idea of nutrition-related risky behaviors and their relation to pregnancy outcome. Relevant literature is organized into sections regarding pregnancy outcome, pregnancy nutrition, and behavioral practices of clay, herb, alcohol consumption, and prenatal care.

Background Information about Uganda

Uganda is a landlocked country in Eastern Africa that measures about 236,040 square kilometers with an estimated population of about 24 million in 2001 (CIA World Fact Book: Uganda, 2002). The Gross National Product per capita in 2000 was estimated to be US $ 310 (Uganda, Facts at a Glance, 2002) or less than a dollar per day per person. In 1993, about 55% of the people lived below the poverty line (CIA World Fact Book: Uganda, 2002). Low income, food deficits, civil strife, inadequate health services, and a high prevalence of HIV/AIDS are some of the specific problems facing this population (Ministry of Health-Uganda, 1999). Antenatal clinic rates for HIV/AIDS in Uganda ranged from 10 to 40% in pregnant women (American Social Health Association (ASHA), 2002). Total fertility rate in 2001 was estimated to be 6.88 children per woman

(CIA World Fact Book: Uganda, 2002), infant mortality was 91 per 1,000 births (Ministry of Health-Uganda, 1999), and maternal mortality due to pregnancy and childbirth was 506 deaths per 100,000 live births (United States Agency for International Development, 2002; CIA World Fact book: Uganda, 2002). Per capita health expenditure was estimated at US $12 in 1995/96 (Ministry of Health-Uganda, 1999).

Pregnancy Outcome

Pregnancy is a period of rapid growth and development for the fetus, placing high physiologic and metabolic demands on the mother. The ability to bring to term a healthy infant depends on a woman's general health and well-being before conception and the amount and quality of care provided during pregnancy (Mitchell, 1997). According Wilcox and Skerven (1992) the important measures of a successful pregnancy are perinatal mortality, infant birth weight, and gestational age.

Nutrition is an important factor in successful reproduction; however, the correlation between nutrition and reproductive performance is complicated by variations in age, parity, socioeconomic status, educational status of the mother, health of mother, and mother's use of health care (Viteri, et al., 1989; Institute of Medicine, 1990; Mitchell, 1997). According to the Institute of Medicine (1990), insufficient food intake has been associated with poor pregnancy outcomes. United States Agency for International Development (USAID) (2002) reported that 500 million women of reproductive age suffer from anemia and other nutrient deficiencies, and poor weight gain that affect the health of the mother and survival of the child, worldwide. The description of the practices that may influence the diet of pregnant women is therefore important and timely.

Low Birth Weight

Risk factors for low birth weight are numerous and have been well documented (Institute of Medicine, 1990; Shiono and Behrman, 1995). Previous research has examined maternal sociodemographic, psychosocial, and behavioral factors that significantly increase the rate of low birth weight. Sociodemographic factors associated with low birth weight include young or old maternal age; low maternal education (Showstack et al., 1984); not married (Pagel et al., 1990); high parity (Strobino, 1982); poverty, and maternal stress (Institute of Medicine, 1985; Kopp and Kaler, 1989).

Behavioral risk factors include inadequate diet and nutrition (Klebanoff et al., 1991; Kramer et al., 1994; Mathews et al., 1999; Scholl and Hedigar, 1994). In the study by Scholl and Hedigar (1994), malnourished women were more likely to have miscarriages, stillbirths or babies with intrauterine growth retardation (IUGR) or low birth weight, and inadequate weight gain (Kleinman, 1990). Other nutrition-related factors associated with low birth weight include alcohol use (Nandi and Nelson, 1992; Abel, 1997), pica (Rainville, 1998; Geissler et al., 1999), and use of illegal drugs (Ornoy, 2002; Robins and Mills, 1993). Non-nutrition behavioral factors associated with low birth weight are smoking (Pollack et al., 2000; Kleinman, 1990; Wilcox, 1993) and poor utilization or inadequate prenatal care services (Sable and Herman, 1997; Institute of Medicine, 1985; Day et al., 1989; Larroque et al., 1993).

Low birth weight is defined as a birth weight of less than 2,500 g (Institute of Medicine, 1990) and very low birth weight is birth weight less than 1,500 g (Kopp and Kaler, 1989; Miller, 1985). Low birth weight, a negative birth outcome, is widely used as an indicator of infant frailty and is a major determinant of infant mortality (Institute of

Medicine, 1985). Low birth weight and its major antecedent, prematurity, are the leading causes of neonatal mortality (Institute of Medicine, 1990). Infants who are born with low birth weight may be categorized as small-for-gestation or growth retarded, and/or preterm or premature (Worthington-Roberts and Williams, 1997). Infants born with a low birth weight may experience respiratory distress syndrome, poor body temperature control, salt and water imbalances, low blood sugar, jaundice, brain damage, anemia, heart problems, and intestinal inflammation (Abel, 1997). The long term outcomes of low birth weight are related to neurological and developmental, cognitive capacity, adaptive skills, and scholastic performance problems (Haas et al., 1996; Barker, 1994).

Advances in perinatal medical technology in developed countries have improved pregnancy outcomes leading to dramatic decreases in the rate of infant mortality but only slight improvement in the rate of low birth weight (Goldenberg, 1997). With improved medical care in the US, the survival rate of low birth weight infants increases with advancing gestational age and levels off at 32 weeks or 1,500 g with approximately 93% survival rate (Stubblefield, 1993).

Pica

Pica is the compulsive ingestion of non-food substances. Pica is a Latin word meaning magpie, a bird known for indiscriminate eating of substances (Concise Oxford Dictionary, 1995). Pica has no universally accepted definition. Some authors use the narrow definition that pica is the persistent eating of non-nutrient substances (Rainville, 1998; Rose et al., 2000; Simpson, 2000). Others extend the definition to include the eating of both food and non-food items (Smulian et al., 1995; Cooksey, 1995) while

others include the mouthing and sucking of objects by children 18 months and older (Walker et al., 1997). The criteria for pica listed by The Diagnostic and Statistical Manual of Mental Disorders (DSM IV) includes: 1) the frequent eating of non-nutritive substances for at least one month, 2) the behavior is inappropriate for the developmental stage, 3) the behavior is not part of a culturally sanctioned practice, and 4) the behavior is not associated with another mental disorder, such as mental retardation, or if the behavior occurs in connection with another disorder, it is severe enough to justify a separate clinical diagnosis (American Psychiatric Association, 1994).

Pica has occurred for centuries (Parry-Jones and Parry-Jones, 1992; Cooper, 1957; Lacey, 1990; Walker et al., 1997). Parry-Jones and Parry-Jones (1992) gave a comprehensive summary of the historical accounts of pica from 1230 to the last century. Pica is a complex phenomenon involving numerous factors, including behavior, environment, and culture. Pica has been examined in anthropological (Laufer, 1930; Wiley and Katz, 1998; Geissler et al., 1999), biochemical (Hunter, 1993; Walker et al., 1997), geographical (Vermeer and Ferrell, 1985), geological (Abraham and Parsons, 1996), medical (Gelfand, 1945; Geissler et al., 1998; Rose et al., 2000), microbiological (Ketch, 1998), nutritional (Rainville, 1998), psychiatric (Danford and Huber, 1982; Parry-Jones and Parry-Jones, 1992; American Psychiatric Association, 1994), and zoological (Ketch, 1998) perspectives. Some studies showed abnormal eating behaviors to be associated with psychologic (mental illness), neuropsychiatric (brain lesions), pharmacologic (medicine), cultural (learned pattern of behavior), physiologic, nutritional (dietary supplementation to mineral deficiency), and psychosocial behaviors (result of family stress or as an addiction) (Rose et al., 2000; McLoughlin, 1987).

To clearly define pica, a consideration of the type of substance consumed, extent of pica, the degree to which various types of pica are exhibited, frequency of the behavior, and the suggestion of its etiology are warranted. Types of substances craved and ingested may include a variety of non-food substances. Non-food pica includes the eating of dirt or clay (geophagia), laundry starch or cornstarch (amylophagia) (Rainville, 1998; Horner et al., 1991; Institute of Medicine, 1990), ice or freezer frost (pagophagia), raw potatoes (geomelophagia), baking soda, baking powder, baby powder (Rainville, 1998; Lacey, 1990), stones (lithophagia), sharp objects (acuphagia), hair (trichophagia), burnt matches (cautopyreiophagia), feces (coprophagia), plant stems (foliophagia), lead paint chips (plumbophagia), (Lacey, 1990; Edwards et al., 1959) plaster, ashes, and charcoal (Cooper, 1957).

The extent of pica can be defined as the consumption of a specific pica that is limited to one pica substance only or pica that includes consumption of more than one substance (McLoughlin, 1987). While some studies indicate single pica practice (Geissler et al., 1998; Geissler et al., 1999; Abrahams, 1997) others indicate multiple pica practices (Simpson, 2000; Rainville, 1998; Smulian et al., 1995; McLoughlin, 1987).

To correctly identify pica behavior, it is important to note the quantities consumed and frequency or regularity of the behavior. A review of the literature indicates clay consumption by pregnant women ranged from 2-650 g/day and starch consumption was up to 950 g/day (O'Rourke et al., 1967; Vermeer and Frate, 1979; Geissler et al., 1998; Geissler et al., 1999). Smulian et al. (1995) reported difficulty in quantifying the amount of various pica substances consumed.

Diagnosis of pica is difficult because of differences in the definition of pica and the consideration that pica may be an accepted behavior in some cultures (Smulian et al., 1995). Thus diagnosis of pica depends on cultural attitudes toward pica, types of pica objects consumed, amounts ingested, and degree of cravings (Smulian et al., 1995).

Pica Prevalence

The incidence of pica in adults remains difficult to estimate particularly since 1) the degree of embarrassment involved leads to a concealment of the abnormal practice resulting in an underestimate of its occurrence (Sayetta, 1986); 2) there have been few epidemiological studies on the prevalence of pica; 3) studies have used different criteria to define pica (Rainville, 1998); 4) the practice of pica varies geographically, regionally, by age group, race, gender, culture, and social status (Walker et al., 1997; Horner et al., 1991); and 5) lack of specific pica screening tests (Rose et al., 2000; Horner et al., 1991; Anell and Lagercrantz, 1958). Most studies report a higher pica prevalence in low socioeconomic and underdeveloped areas (Horner et al., 1991; Walker et al., 1997; Rose et al., 2000; Smulian et al., 1995; Sayetta, 1986; Anell and Lagercrantz, 1958), and in black populations (Walker et al., 1997; Rainville, 1998; Geissler et al., 1989; Geissler et al., 1999).

Pica prevalence during pregnancy is reported to range from 0%-68% in the United States (Smulian et al., 1995) and 90% in Africa (Hunter, 1993). A review of studies published from 1964 to 2000 showed greater pica prevalence in low socioeconomic status areas and among pregnant women (Rose et al., 2000). Pica was practiced by 57% of pregnant women in Holmes County, Mississippi (Walker et al., 1997), 54% among

women enrolled in WIC (Special Supplemental Nutrition Program for Women and Infants) in Houston (Rainville, 1998), 31% among low-income Mexican-born women living in California (Simpson, 2000), and 14% in pregnant women in rural Muskogee County, Georgia (Smulian et al., 1995). One African study showed a pica prevalence of 38% in urban and 44% in rural areas (Walker et al., 1997). On the Kenyan coast, 56% of pregnant women were geophagous (Geissler et al., 1998) and in a similar sample, 72% of pregnant women were geophagous (Geissler et al., 1999).

Risk Factors for Pica

Suggested risk factors of pica varied between studies. A meta-analysis of dirt, clay, and starch practices among American women found that black women were more likely to practice pica than women from other racial backgrounds (Horner et al., 1991). Residing in a rural area, geographical area, impaired nutritional status, greater maternal age, childhood pica, family history of pica, and non-pregnant history of pica were found to be risk factors for pica (Horner et al., 1991). The behavioral characteristics of rural pregnant women in Muscogee County in Georgia, included cravings (33%), pica before pregnancy (57%), childhood pica (33%), and family members with pica (57%) (Smulian et al., 1995).

Geophagy

Geophagy is the eating of soil or clay (Dorland's Pocket Medical Dictionary, 1995). More specifically, geophagy means the deliberate consumption of soils by animals or

people (Callahan, 2000; Abrahams and Parsons, 1996; Cooper, 1957; Vermeer and Frate, 1979; Johns and Duquette, 1991).

Geophagy source materials include a variety of soils and sources. The soils eaten are often rich in clay or salt (Gelfand, 1945). Hunter (1993) reported soils to include termite mounds (macrotermes), red-ant and white-ant clay, soil from the smoked brittle hearth, white clay from the stream banks, ant clay deposited on trees and wood (arboreal), fireside and house soil, and burrow pit clay. Geissler et al. (1998) reported consumption of soil mainly from house walls and termite mounds.

There are theories that attempt to describe the global practice of geophagy. Hunter (1993) calls geophagy a worldwide phenomenon, which is practiced by people from different racial origins, age groups, and geographical areas. Theories that attempt to explain geophagy range from a learned pattern of behavior for relieving the nausea and vomiting of pregnancy to the body's instinctive search for deficient nutrients (Wiley and Katz, 1998). Soil has been eaten for a variety of reasons throughout history. The earliest English language description of geophagy is a translation made by John Trevisa in 1938 of the 13th century Latin work of Bartholomeus de Glanville, De Proprietatibus Rerum which states that "sometyme the appetite chaungeth and desireth noyful thinges, as coles, erthe, salt, and other suche" (Liebault, 1582).

Reported reasons for geophagy include the tactile properties of smoothness, and taste (sweet, sour, or salty) of clay; the olfactory sense such as the smoke flavor of clay, and the strength (power to stick in the mouth and absorb saliva) of clay (Edwards et al., 1959; Geissler et al., 1999; Simpson, 2000). Having many children, scarcity of meat, hunger and famine were other reasons listed for eating dirt (Hunter, 1973). Global reasons for

eating earth can be grouped accordingly as: 1) medicine, 2) famine food, 3) religion, magic or ceremonial event, 4) nutrient supplement (Abrahams, 1997), and 5) pregnancy related (Rose et al., 2000; Wiley and Katz, 1998; Abrahams and Parsons, 1996).

Worldwide, several medicinal properties of clay are claimed (Horner et al., 1991; Wiley and Katz, 1998). People have used soil to treat external diseases such as bubonic plague, leprosy, eczema, and herpes (Hooper and Mann, 1906; Laufer, 1930). Internally, soil has been used to treat diarrhea (for example, kaolin the active ingredient in kaopectate is clay) (Vermeer and Ferrell, 1985) and nausea (Anell and Lagercrantz, 1958; Vermeer and Ferrell, 1985). Some groups presume that geophagy acts as an antidiarrheal medication and is consumed to counter gastrointestinal distress as practiced in West Africa (Vermeer and Ferrell, 1985). Others propose that dietary clay can detoxify toxins found as secondary compounds in plants by adsorption of toxins in the gastrointestinal tract (Johns and Duquette, 1991).

In Uganda, soil is commonly used for traditional medicine (Abrahams and Parsons, 1996). In 1989, a Ugandan female became famous when she claimed soil had healing properties. Several people suffering from all kinds of diseases including those infected with HIV/AIDS camped for days at her home to receive the soil with healing properties (Abrahams and Parsons, 1996). Uganda newspapers ran several pictures of the massive pit that was created as a result of this treatment.

Some studies indicate nutritional benefits of geophagy (Geissler et al., 1998; Abrahams, 1997; Wiley and Katz, 1998). The hypothesis that geophagy fulfills nutritional need for the minerals in clay has not been conclusive (Hunter, 1973; Hunter, 1993; Abrahams, 1997; Lacey, 1990) due to variations in calcium bioavailability

(absorption) in clays with some providing trace amounts while others provide over 80 percent of the Recommended Dietary Allowance (Wiley and Katz, 1998).

A chemical analysis of two Zambian and 13 Ugandan clays revealed nutritional benefits of clay and mound soils (Table 2). Magnesium, calcium, copper, and manganese were present in the Zambian soils in amounts comparable to the Recommended Dietary Allowances (RDA) (National Research Council, 1989) (Hunter, 1993; Abrahams, 1997). Abrahams (1997) reported the potential benefit of clay in supplying bioavailable minerals to consumers. Estimated bioavailability of iron from soils in Uganda after extraction with 0.1m HCl ranged from 3% to 42% of the Recommended Nutrient Intakes (UK) for iron for males (Abrahams, 1997). Sodium, copper, and zinc were also present in Uganda clays (Abrahams, 1997). On average, women who consumed 30 to 300 g of clay were shown to have higher serum calcium levels than women who did not consume clay (Edwards et al., 1964). The acidic conditions of the stomach were suggested to enhance mineral availability and the ability of clay to exchange with other cations of similar charges while the reverse was postulated for the more basic conditions of the small intestines. It was concluded that the net effect of clay would depend on the nutrients, type of food, and location in the gastrointestinal tract (Wiley and Katz, 1998).

Wiley and Katz (1998) examined the practice of geophagy among African populations who kept cattle and those who did not keep cattle. They found that geophagy during pregnancy was higher in the non-cattle keepers. They hypothesized that geophagy was practiced more often in this population because of lower calcium intakes in the mainly plant based diet (cereal grains and starchy roots) and may be due to the increased

calcium needs during pregnancy. The results of the investigation by Wiley and Katz (1998) were not conclusive in regards to the benefits of clay consumption.

Soil ingestion in relation to famine has been noted among the Chinese, New Zealanders, New Caledonians, Indians, Mongolians, Germans, Finns, Africans, North Americans (Laufer, 1930), South Americans (Laufer, 1930; Cooper, 1957), and Nigerians (Vermeer, 1966). A CNN report (2002) indicated that some people were eating dirt to alleviate hunger during the recent famine in sub-Saharan Africa. In Salisbury in Southern Rhodesia (Zimbabwe), male adult patients reported eating soil when meat was scarce, when they felt hunger or when there was famine (Gelfand, 1945).

Soil has been eaten in religious ceremonies in Africa (Gelfand, 1945), Mexico, Barbados, China, Burma, and Malaysia (Laufer, 1930). Diatomaceous earth in China was often hailed as having a supernatural origin, and the finding and ingestion of this earth was viewed as a happy omen (Laufer, 1930). Geophagy also occurs in various cultures in conjunction with the swearing of oaths (Abrahams and Parsons, 1996). In Zimbabwe, soil was placed in the hands of the Mashona chief as part of the installation ceremony. In Liberia, yearly sacrifices were made to the earth and it was not uncommon for people crossing territories to partake of soil in the new territory as an act of homage to the spirit of the alien soil (Gelfand, 1945).

Geophagy During Pregnancy

According to several studies, geophagy appears to be common in the African population where it is mainly associated with pregnancy. Hunter (1993) described consumption of clay by pregnant women and cattle in five South African countries. Even

in this population, the etiology is poorly understood (Wiley and Katz, 1998; Walker et al., 1997; Lacey, 1990; Horner et al., 1991). In this population, geophagy has been referred to as a "culturally instituted, transcultural, multicausal phenomenon" (Hunter, 1993, p 69).

Geophagy occurs most commonly during pregnancy. From the 16th to the 20th century, it was believed a danger to stop pregnant women from eating whatever they wanted. "Such a power hath this Pica and Malacia in women with child, that if they cannot enjoy the foode, or all other things as they desire, they or their young ones ar in danger of death" (Liebault, 1582). In East Africa, the practice of geophagy extends to 40,000 years ago (Abrahams and Parsons, 1996) and may be based on the fertility of the earth, religious beliefs, and magical powers of soil (Gelfand, 1945). This belief led women to eat soil before, during, and after pregnancy and encouraged female offspring to eat soil to secure their future fecundity (Gelfand, 1945). This seemed to be the case in Uganda and Sudan where the indigenous peoples associate geophagy with fertility (Anell and Lagercrantz, 1958).

Beliefs associated with geophagy during pregnancy and the reasons for soil consumption in pregnancy are varied. Hunter (1993, p 75) cited a senior female African government doctor in Malawi saying "It would be very surprising if pregnant women in Malawi did not eat clay. That is when you know when you are pregnant!" Among some Nigerian tribes women ate white clay for the most part of the first trimester for luck (Gelfand, 1945). Bearing handsome children was another belief that was associated with geophagy (Cooper, 1957). Some Indonesian pregnant women ate earth so as to have children with a lighter skin, while in Egypt pregnant women consumed clay believing that their child would be born with a dark complexion (Anell and Lagercrantz, 1958).

Women also indicated that worm infestation increased saliva and resulted in geophagia, and on the other hand, worm infestation drove women to eat clay because worms feed on soil (Geissler et al., 1998; Geissler et al., 1999).

Few studies have reported prevalence of geophagy among pregnant women. At their hospital in Georgia, USA, O'Rourke and colleagues (O'Rourke et al., 1967) noted the visitors' gifts of clay boxes to obstetric patients. The prevalence of geophagy among pregnant women is estimated to be 90% in Malawi, Zambia, Zimbabwe, Swaziland, and South Africa (Hunter, 1993). Geophagy was widespread on the Kenyan coast; of 52 pregnant women interviewed, 73% consumed soil. The amount of soil consumed daily ranged from 2.5 to 219 g with a median of 41.5 g. Of the women who ate soil, most (84%) ate soil daily. Gestational age of women who ate soil was 5 to 9 months, with most starting the practice in the second half of their pregnancy. The subjects mostly ate soil from the walls of houses (sedimental red loam soil) (72%), while others ate grey clay (15%), termite soil (9%), and soft stones from riverbeds (4%). The red loam soil was eaten for its texture and smoke smell; the grey clay and soft stones for their taste, packaging, cleanliness and smooth dissolve; and the termite soil for its salty taste. The motives for eating soil were gender specific and included being pregnant, liking clay, tasting nice, 'satisfying' urge, compelling urge to eat soil (an urge), and counteracting nausea and excess saliva.

Few studies have been written on the perceptions of geophagy among the East African populations (Geissler et al., 1999). Geissler et al. (1999) explored the ideas about soil eating and its impact on health held by women on the Kenyan coast in East Africa. Women were not specific about the causes of clay eating (Geissler et al., 1998). Clay

consumption has been hypothesized to reduce pregnancy sickness symptoms of nausea, discomfort, vomiting, and gastrointestinal distress (Hunter, 1993; Hunter, 1973; Wiley and Katz, 1998; Geissler et al., 1999; Simpson, 2000). Geissler et al. (1998) noted that geophagy was considered to cause anemia or "safura" which was believed to be only treatable by a traditional healer. However, the description of safura was similar to biomedical anemia with edema of the limbs, stomach, cheeks and face; dizziness, palpitations, breathlessness, and paleness (Geissler et al., 1998; Cooper, 1957). Lack of blood termed as "upungufu wa damu" was thought to be treatable by an improved diet, tablets, and blood transfusion. "Tsango" (to do with spirits) was also mentioned in relation to the geophagy practice (Geissler et al., 1998).

Harmful Effects of Pica Practice

Pica behavior has been associated with several negative outcomes that include 1) nutritional deprivation in the extreme resulting in menorrhagia; 2) inherent toxicity, including the direct toxic effects of substances such as lead; 3) obstruction and dysfunctional labor due to fecal impaction (Abrahams and Parsons; 1996); 4) excessive calorie intake, related to starch eating; 5) toxemia; 6) parasitic infestation due to eating contaminated soil; and 5) dental injuries resulting from eating hard stones (Walker et al., 1997; Rainville, 1998; Simpson, 2000; Smulian et al., 1995; Horner et al., 1991).

Impact of Geophagy and Pica on Nutritional Status

Some of the possible adverse effects on the mother and the fetus are the association of pica with displacement of essential nutrients or energy from food, the reduced absorption of required nutrients, ingestion of toxins or parasites, and intestinal

obstruction or bowel perforation (Rose et al., 2000; Horner et al., 1991). Pica is associated with poor nutritional status, particularly deficiencies of iron, zinc, and calcium (Rainville, 1998; Wiley and Katz 1998; Smulian et al., 1995; Mokhobo, 1986; Hunter, 1993). However, not everyone with iron or zinc deficiency consumes soil, nor does everyone with pica have iron, calcium, or zinc deficiency (Mokhobo, 1986; Mitchell, 1997).

Some studies show that pica is related to iron deficiency. Although pica is common in iron deficiency, the substances pica practitioners crave are poor in iron, such as ice (Mitchell, 1997). In some cases, pica itself contributes to the iron deficiency. There is evidence that pica practice contributes to iron deficiency anemia (Smulian et al., 1995; Rainville, 1998). For example, Rainville (1998) found that pica was significantly associated with lower maternal hemoglobin at delivery. Rainville (1998) stated that some clay contained substances that bound iron and decreased iron absorption, however, a cause and effect relationship was not established. However, most of these studies were based on samples of women in developed countries.

Herbal Medicine in Pregnancy

People use traditional medicines based on what they learn from their culture and ethnic group as typical treatment (Beal, 1998). Traditional medicines have important cultural meanings, may have beneficial medicinal effects, and may be more cost effective than modern pharmaceutical drugs. Indigenous cultures have developed knowledge of local plants and foods that can promote health and cure illness (Beal, 1998). Chhabra and Mahunnah (1994) investigated fertility related medicinal herbs used by the Hayas of

Tanzania and found active therapeutic components in most herbs. Since many herbs have been used in the world for several centuries, information furnished about safety and effectiveness cannot be discounted. Herbs were reported to be significantly cheaper in cost than pharmaceutical counterparts and therefore served best for women where availability and access to health services were limited (Belew, 1999).

Traditional medicines include herbs that are used for infertility, conception, pregnancy, lactation, menstrual problems, discomforts and dysfunctions of pregnancy, labor, and menopause (Westfall, 2001; Beal, 1998; Varga and Veale, 1997; Mabina et al., 1997). Ingestion of herbal medicines is high in African countries with herbal ingestion rates of 45% (Kasilo and Nhachi, 1992; Mbura et al., 1985; Larsen et al., 1983; Veale et al., 1992; Varga and Veale, 1997). For example, several studies reported traditional herbal remedies used in the sub-Sahara by women during pregnancy (Varga and Veale, 1997; Mitri et al., 1987; Larsen et al., 1983; Chhabra and Mahunnah, 1994; Mbura et al., 1985). In this region, knowledge of herbal medicine was not the exclusive property of herbalists; women also named the herbs and their uses (Mitri et al., 1987).

Herbal medicines are widely sold in markets, street vendors, and hospitals in Uganda. As in Tanga, Tanzania, the use of herbal medicine and herbal medicine mixed in substances such as clay during pregnancy remains widely spread (Mbura et al., 1985). Herbal clay is mostly ground into a powder, measured into a glass and mixed with water to form a slurry before drinking (Abrahams, 1997).

Varga and Veale (1997) examined maternal and fetal health effects of the use of herbal medicine (isihlambezo) among Zulu women in South Africa. Reasons for use of herbal medicine were: it provided quick and painless delivery, reduced edema, reduced

vaginal discharge or wetness, reduced placental size, and provided spiritual cleansing or protection from evil forces. Women used two forms of herbal medicine. During the first month of pregnancy, women drank herbs to cleanse and prepare the womb for carrying the fetus. During the second trimester, women drank herbs to strengthen and protect the mother and the fetus (Varga and Veale, 1997).

Mbura et al. (1985) investigated the use oral herbal medicine among 214 pregnant women who attended an antenatal clinic in Tanzania. Use of herbal medicines was similar in rural and urban women (40%). Herbal use was highest towards the end of the first trimester and during labor (87.7%). About half used herbal medicine to relieve pregnancy related symptoms and the rest used herbs as a result of beliefs, superstitions, circumstantial constraints, and combinations of all the above. Pregnancy related conditions for which women used herbal medicine were nausea and vomiting, prolonged labor, induction of labor, multiple symptoms, urinary symptoms, postpartum hemorrhage, and retained placenta (Mbura et al., 1985). Specific reasons cited for use of herbal medicine included the enhancement of uterine contraction during labor, shortage and insufficient drugs and modern health services, protection against evil influence, lack of transport to hospital, effectiveness of herbal medicines over modern medicine, as an alternative to failed modern medicine, to get a male baby, fears of health facility, long distance to health facility, and no knowledge but a cultural practice (Mbura et al., 1985).

Health Implications of Herb Use

The use of herbal medications in pregnancy may have untoward effects on labor and the fetus (Mbura et al., 1985; Mitri et al., 1987; Beal, 1998; Westfall, 2001; Belew,

1999). Women's use of herbal medication may be associated with teratogenesis due to its use during the vulnerable period of gestation (Shoental, 1972). Toxic or carcinogenic substances in herbal medicine ingested during pregnancy have been implicated in childhood disorders such as malnutrition, congenital malformation, and tumors (Shoental, 1972). Deaths have been associated with the use of herbal medicine in women who developed acute renal failure in Zambia, and ruptured uteri in women in Cameroon (Nasah and Drouin, 1978), in Uganda (Personal communication from Mr. Okoth, 2001) and in South Africa (Mabina et al., 1985; Varga and Veale, 1987). Maternal toxicity and increased rates of meconium passage and higher caesarean sections in women were associated with ingestion of herbal medicine.

Mabina and coworkers (1997) determined the effect of herbal medicines in 229 pregnant women in early labor in South Africa. Fifty-five percent ingested herbs. Of the women who ingested herbs, 55% had meconium passage and 38% underwent caesarean section while in the women who did not ingest herbs, only 15% had meconium and 22% had caesarean section. It was concluded that the use of herbal medication may be related to fetal distress as indicated by the increased frequency of meconium passage and delivery by caesarean section (Mabina et al., 1997). Mitri et al. (1987) interviewed women about the use of castor oil and "ishlambezo" (herbal medicine for pregnancy) in 498 women. Meconium passage was observed in 174 (36%) women and was significantly associated with herb use. The association of herbs with passage of meconium may be related to stimulation of uterine activity or fetal bowel function (Mitri et al., 1987).

Common Herbs Used in Pregnancy

Some herbs are well known remedies, others are toxic, and many more do not have an established benefit (Bairacli-Levy, 1966). Herbs commonly used in North America for the nausea of pregnancy include peppermint, spearmint, ginger root, raspberry leaf, fennel, chamomile, hops, meadowsweet, and wild yam root (Dog and Crawford, 1993; Beal, 1998). Herbs used in preparation of the uterus for labor and for promotion of effective labor include raspberry leaves, and blue and black cohosh (Beal, 1998). Blue cohosh contains glycoside caulosaponin, which hastens childbirth. Caulosaponin constricts coronary blood vessels and is toxic to the heart muscle in animals, increases fetal heart rates, and increases fetal distress that is accompanied with meconium passage. Excess doses of black cohosh can cause severe headaches, dizziness, nausea, and vomiting (Ordy, 1999).

Alcohol Consumption and Pregnancy Outcome

Alcohol abuse and dependency are serious problems that result in social and medical problems during pregnancy (US Department of Human and Health Services, 1990). The adverse effects of heavy and chronic maternal drinking during pregnancy on fetal growth were established in late 1960s (Passaro et al., 1996). These effects were identified as fetal growth deficiency, specific morphological abnormalities including characteristic facial features and neurobehavioral abnormalities (central nervous system dysfunction) (Jones and Smith, 1973; Cornelius et al., 1999; Jacobson et al., 1996). The central nervous system manifestations included delayed development, hyperactivity, poor motor coordination, learning or attention problems, seizures, mental retardation, and/or

microcephaly. The adverse effects of alcohol on fetal growth and development have been associated with the amount and time of alcohol exposure (Lundsberg et al., 1997). The teratogenic effects of alcohol on the fetus include a severe form, Fetal Alcohol Syndrome (FAS) and a milder form, Fetal Alcohol Effects (FAE) (US, Department of Human and Health Services, 1990).

Studies show timing and frequency of prenatal alcohol exposure may be related to the effect of alcohol on the fetus. Jacobson and Jacobson (1999) found the effects of moderate prenatal alcohol exposure on children's growth were modest with retardation occurring before birth but with slower growth during the first 6-8 months after birth. A significant association was found between moderate drinking (defined as more than 7 drinks per week or more than 5 drinks per occasion (Centers for Disease Control, NCHS, Definitions, 1997) during pregnancy and children's adverse neurobehavior (Jacobson and Jacobson, 1999). The risk for FAS was increased in older and younger mothers who consumed 7 or more drinks per week during the pregnancy (Jacobson and Jacobson, 1999).

Passaro et al. (1996) examined the association of maternal drinking before and during early pregnancy on infant birth weight. They found that women who reported drinking one to two drinks daily with at least one binge, or three or more drinks daily with or without a binge, had an adjusted mean birth weight of about 150g less than that of infants whose mothers reported abstaining from alcohol intake during pregnancy.

Lundsberg et al. (1997) found that mild drinking of alcohol during the first month of pregnancy was associated with a protective effect on intra uterine growth retardation. Overall, drinking during the first month of pregnancy suggested a curvilinear effect on

growth retardation, with consumption of greater than 1 oz of alcohol per day showing an increased risk. Drinking during the seventh month was associated with an increase in the odds of preterm delivery for both mothers with light and mild to moderate alcohol consumption.

According to Chang et al. (1999), there is no universally safe level of alcohol consumption. There is evidence that prenatal alcohol consumption at levels less than one drink per day can affect fetal growth and development. The definition of a drink is however, complicated by the lack of standard for various drinks of different sizes and alcohol content. Drinks that are poured such as wine and distilled spirits have no definitive size. The size depends on the person pouring. In alcohol research there is no universally accepted standard drink (Dufour, 1999; May et al., 2000).

Furthermore, no consensus exists as to the best methods or questions for eliciting reliable information on how much alcohol a respondent drinks. There is a substantial difference in the alcohol content within each alcoholic beverage and across types of alcoholic drinks. For example the alcoholic content of wines ranges between 7-11%, spirits 40-50%, and beers less than 3-9% (Greenfield et al., 2000)

Brief History of Alcohol in East Africa

In the first half of the 19th century, there were no distilled liquors in East Africa. However, there were locally fermented drinks that were shared among people (Uganda Lecture: "Drinking History", 1999; African Studies Center, 2002). The colonial rule is suspected to have begun the spread of distilled liquors including the selling of alcoholic beverages for economic benefit (Uganda Lecture: "Drinking History", 1999; African

Studies Center, 2002). The making and selling alcohol is a source of income for both men and women (African Studies Center, 2002).

Table 3 shows some of the names used for the locally produced alcoholic beverages. There are doubts about the safety of the illicit distillates. Techniques of production are poorly controlled, so that the alcoholic strength of these drinks may vary greatly. Some studies have suggested there is a danger of poisoning from toxic forms of alcohol, metals, and other chemicals from the distilling apparatus (Tüsekwa et al., 2000). Producing illicit spirits from industrial alcohol or mixing them with the industrial alcohol has been shown to cause mass poisoning in Kenya and methanol production caused blindness in individual in Uganda in the early 70s (Kariuki wa Mureithi, 2002).

A survey conducted in Bunyoro, Uganda indicated that of the 61 participants, 46 drunk alcohol, 42 had 67 drinking episodes the week preceding the survey, and 38 had previously or were currently engaged in brewing alcohol mainly for sale (African Studies Center, 2002).

Prenatal Care

Uses and Content of Prenatal Care

Prenatal care emphasizes the detection and management of complications of pregnancy. Prenatal care is useful in identifying women at risk and providing appropriate follow-up to minimize that risk (Sable and Herman, 1997; Gehshen, 1995). Prenatal care is considered timely if a woman makes her initial visit during the first trimester and is classified as untimely if it is late.

Numerous studies have documented the positive effect of prenatal care on birth outcomes but prenatal care has not been conclusively demonstrated to improve birth outcomes (Institute of Medicine, 1985; Fiscella, 1995; Alexander and Korenbrot, 1995). One reason is that little is done during routine prenatal care visits to reduce low birth weight such as promotion of smoking cessation and good nutrition (Alexander and Korenbrot, 1995). Most studies examining the impact of prenatal care on low birth weight have assessed adequacy of prenatal care by the quantity and early initiation of prenatal visits rather than by the specific content of prenatal care visits (Institute of Medicine, 1985).

The Public Health Service Expert Panel on the Content of Prenatal Care recommended that the following procedures and advice be included within the context of prenatal care: breastfeed; reduce or eliminate alcohol use; reduce or eliminate smoking; avoid illegal drugs such as marijuana, cocaine, or crack; eat the proper foods during pregnancy; take vitamin or mineral supplements; and gain an appropriate amount of weight during pregnancy (Public Health Service, 1989).

Delivery of Prenatal Care by Health Professionals

Some research, however, shows that health care providers are not uniformly performing behavioral risk assessments or offering health promotion and education in early pregnancy (Kogan et al., 1994; Peoples-Sheps et al., 1996). A study of addicted women found that even when prenatal care providers asked women about their drug and alcohol use, most women were not given information about the effects of alcohol or drug use on their babies and very few were referred to drug counselors or programs (Gehshen,

1995). Kogan and colleagues (1994) analyzed data from the National Maternal and Infant Health Survey (NMIHS) to examine the impact of the Expert Panel's recommendations on birth outcomes. Mothers who did and did not receive the recommended medical procedures during the first two prenatal visits had similar birth outcomes. However, significant differences existed based on whether women received specific types of health behavior advice or instructions during any of their prenatal visits (Kogan et al., 1994). Kogan et al. (1994) compared birth outcomes for women who received all seven recommended types of health behavior advice with those who reported receiving none or only some of the seven types of advice during any of their prenatal visits. The study found that women who received all seven types of advice were less likely to deliver a low birth weight infant than those who received none or only some of these types of advice.

Similarly, Sable and Herman (1997) examined the relationship between content of prenatal care and incidence of very low birth weight in a population-based case-control study using data from the National Institute of Child Health and Human Development/Missouri Maternal and Infant Health Survey (MMIHS). The study population consisted of 450 fetal death cases, 779 singleton very low birth weight cases, 799 singleton low birth weight controls, and 800 singleton normal controls. Birth outcomes for 2205 women who received all seven types of advice were compared with those of women who received none or only some of the seven types. They also examined how frequently other types of health behavior advice were given to women by their prenatal care provided. Women who reported receiving fewer than all seven types of advice were 1.49 times more likely to have had a low birth weight infant than a normal weight infant. The findings in this study support Kogan et al. (1994) that women who do

not receive all of the advice recommended by the Public Health Service Expert Panel seem to have an increased risk of giving birth to very low birth weight infants.

Grounded Theory Method

Glaser and Strauss (1967) developed the Grounded Theory Method (GTM) (also called the constant comparative method) as a general theory of scientific method. GTM starts with a phenomenon that the researcher finds to be inadequately explained in theory and with a well-defined research problem (Corbin and Strauss, 1990). Constant comparison includes comparing the data until a theory emerges and the theory is in turn compared to the data. It was developed and mainly used in the discipline of sociology but can be used successfully in a variety of different disciplines such as education and nursing studies (Corbin and Strauss, 1990).

GTM is concerned with the generation, elaboration, and validation of social science theory. GTM begins with observations and seeks to discover patterns and develop theories from the ground up; it does not begin with a hypothesis. GTM is inductively derived from data, subjected to theoretical elaboration, and judged adequate to its field with respect to a number of evaluative criteria. Four criteria are involved in evaluating studies conducted using the GTM namely: comparing incidents applicable to each category to develop concepts; integrating categories and their properties by noting emerging relationships among concepts; delimiting the theory by eliminating irrelevant concepts; and constructing and writing a theory of the findings in order to understand phenomena. GTM involves data collection, note taking, coding, writing memos, sorting, and writing. These steps are constantly compared during data analysis.

GTM has been used in case studies for the investigation of new concepts and theory. So one approach to grounded theory to use a single tribe or culture. Researchers however, have to state their biases, values, and judgments about the data to increase validity, reliability, and credibility of the research (Babbie, 2001). In addition, GTM should meet the accepted canons for conducting good science such as consistency, reproducibility, and generalizability (Corbin and Strauss, 1990).

Summary

In summary, several biologic and environmental factors affect reproductive health. Studies show that maternal behaviors of poor nutrition and behavioral practices related to nutrition such as alcohol consumption may result in poor pregnancy outcomes. Clay consumption has been implicated in nutritional impairment and thus may have a negative impact on maternal nutrition and successful pregnancy outcomes. Only one study has examined clay consumption during pregnancy in Africa. The present study will attempt to determine the specific type of soil consumption, the extent to which it is used, and the reasons for use in the target population. Medical literature has reported some complications from the consumption of pica substances but no studies were found that asked women about their perceptions of specific benefits and harmful effects experienced by women who consume clay.

The use of herbs is a well-known phenomenon among African cultures but is one that has not received much attention. Reports from South Africa indicate widespread use isihlambezo with accompanying pregnancy complications. The studies that surveyed women only asked if women used herbs but did not explore women's beliefs about the

use of these herbs. The present study will help to identify why and when during pregnancy, women use these herbs, the benefits, and harmful effects experienced by women. With the determination of prevalence and reasons for use, healthcare providers can know how to implement prenatal advice.

Only one study was found on prevalence of alcohol consumption in women of childbearing age in African countries. In South Africa, prenatal alcohol consumption was found to be a major problem in Western Cape Province. Alcohol use is part of the African culture to celebrate childbirth, marriage, and death as well as use for social purposes. It is important for us to understand the various reasons for alcohol consumption by pregnant women.

Guidelines for appropriate prenatal care content have been published. However, it is not known if health care providers in Uganda provide the recommended care. We were particularly interested in determining the advice that health care providers give to pregnant women in relation to the practices of clay, herb, and alcohol consumption.

Table 1. Estimates of Maternal Mortality in Three East African Countries and Three Developed Countries

Country	Maternal Death Per 100,000 Live Births	Lifetime Risk of Maternal Death: 1 in	Maternal Mortality Ratio[2]
Uganda	10,000	11	1,100
Kenya	13,000	13	1,300
Tanzania	13,000	14	1,100
Switzerland	5	6,900	8
South Africa	3,600	70	340
North America	470	3500	12

[1] Adapted from the National Report of Follow-up to the World Summit for Children (WHO/UNICEF/UNFPA, Geneva, 1995).
[2] Maternal mortality ratio is maternal deaths per 100,000 live births.

Table 2. Total and Bioavailable Nutrients after 0.1M HCl Extraction in Soil Samples from Uganda

Soil Sample Number	Total and Bioavailable	Nutrient		
		Calcium mg/kg	Iron mg/kg	Zinc mg/kg
1	Total	2,485	41,424	35
	Bioavailable	1,864	249	1.0
2	Total	1,153	61,758	66
	Bioavailable	1,338	360	10
3	Total	765	31,032	71
	Bioavailable	734	497	14
4	Total	2,371	30,924	52
	Bioavailable	1,855	412	11
5	Total	1,336	31,071	46
	Bioavailable	1,087	331	3.1
6	Total	662	44,779	51
	Bioavailable	666	73	2.0
7	Total	663	30,724	67
	Bioavailable	858	558	2.1
8	Total	613	81,696	99
	Bioavailable	1,787	745	17
9	Total	1,353	49,584	50
	Bioavailable	1,343	671	3.1
10	Total	1,614	33,107	53
	Bioavailable	1,862	952	9.3
11	Total	1,550	16,643	62
	Bioavailable	2,132	939	21
12	Total	2,263	22643	35
	Bioavailable	874	576	4.1
13	Total	349	43,163	37
	Bioavailable	647	884	<1.0

Adapted from Abrams (1997).

Table 3. Local Alcoholic Beverages Consumed in Uganda

General name	*Vernacular names*	% Ethanol
Distillate	*Chang'aa, Enguli, Waragi, Lira-lira, Kasese*	21.0-44.0
Sugar - cane	*Denge*	4.6-5.2
Palm wine	*Mnazi, Tembo*	4.5-7.8
Sugar ferment	*Scud*	4.3-8.3
Mbege	--	3.3
Millet beer	*Malwa, Ajon*	2.3-8.5
Maize	*Kyindi, ebikwete*	2.7-8.06
Banana wine	*Tonto, Mubisi*	2.0-11.0
Bamboo wine	*Ulanzi*	-
Sorghum beer	*Omuramba*	-

[1] Adapted from African Studies Center, 2002.

CHAPTER III

METHODOLOGY

The objective of this study was to examine the reported beliefs and knowledge about the consumption of smoked clay (bumba), herbal clay (mumbwa), and alcohol during pregnancy by women of childbearing age in Uganda. Reasons for the behaviors and their perceived benefits and harmful effects on maternal and infant health were examined in addition to the health care advice targeted at these behaviors. Three studies were conducted with three different samples and methods to address study objectives.

Research Design

The research design was a descriptive design that employed qualitative and quantitative methodological approaches to gather data. Worthen et al. (1997) indicated that no single method is always appropriate for research. The qualitative and quantitative approaches utilized in this study were considered to be appropriate in answering the questions pertaining to this study.

Triangulation, the examination of the consistency of results from different sources and methods for measuring the same constructs was employed (Worthen et al., 1997). According to Leedy (1997), triangulation is used in many types of qualitative methods and is the process of using multiple data collection methodologies, data sources,

approaches to analysis, or theories to check the validity of the findings. For this study, data were collected using a triangulation of focus group discussions, individual interviews, and self-administered surveys. The qualitative methods explored the beliefs and knowledge concerning geophagy and alcohol consumption of women of childbearing age. The quantitative survey method offered an assessment of the women's perceptions of the relation between pregnancy outcome and use of smoked clay (bumba), herbal clay (mumbwa), and alcohol, and health advice given by health care providers.

Methods and Procedures

A series of three studies was conducted with three different types of study participants in Kampala District, Uganda. The first part of the study employed focus group discussions based on the Grounded Theory Method (Corbin and Strauss, 1990) with community women of childbearing age in four divisions of Kampala District. The second part of the study employed individual interviews with newly delivered mothers of infants less than one week old in a hospital setting in Kampala District. The last part of the study was with health care providers who completed self-administered surveys in a hospital setting in Kampala District. All the instruments were developed by the principal investigator, in the US and were modified based on pilot studies conducted in Kampala, Uganda. The procedures for each of the three studies are outlined in the sections below.

Protocols for these studies were approved by the Oklahoma State University (OSU) Human Subjects Institutional Review Board, the Uganda National Council of Science and Technology, Mulago Hospital Administration, and the Department of Gynecology and Obstetrics at Mulago Hospital (Appendices A, B, and C).

General Setting

The study site was Kampala District, in Uganda. Kampala District is home of Kampala City, Uganda's capital. Kampala is bordered by Mpigi district on the south, by Luwero and Mukono districts to the north and east respectively. Kampala has a population of 1.5 million during the day and about 1 million at night (Uganda Ministry of Finance and Economic Planning, 1991). Kampala comprises the divisions of Kawempe, Nakawa, Makindye, Rubaga, and Kampala Central. A Local Council V Chairman (LC V) heads the five divisions; a Local Council V Councilor represents each division.

Focus group discussions including the pilot group were conducted in five district divisions in Kampala District. Mulago Hospital, the largest government hospital (1,780 beds), is located in the Kawempe division of Kampala District (Uganda Ministry of Finance and Economic Planning, 1991). The hospital was the site for interviews with newly delivered mothers and surveys of health care providers.

Study 1: Focus Group Discussions with Community Women

To obtain information regarding the women's beliefs and knowledge about consumption of smoked clay (bumba), herbal clay (mumbwa), and alcohol, focus group discussions with community women were held in Kampala District in the five divisions: Kampala Central, Kawempe, Nakawa, Makindye, and Rubaga. The inclusion criteria for the focus group participants included women aged 18 years and older, from the Ganda ethnic group, who had at least one child, were not pregnant, spoke Luganda, and were able to attend one group meeting lasting about one hour.

Community women were invited to participate in the focus groups through key leaders in the community. Researchers explained the purpose of the study to the Local Council V Councilors (LC V) and permission was received to undertake the present study in their area of administration. The LC V Councilors provided a letter of introduction and names of Local Council II Chairmen (LC II) in Kampala District sub-divisions. The LC II provided names of the Local Council I Chairmen (LC I) who assisted with the recruitment of participants for the present study. The LC I Chairmen were approached with the letter introducing the research team and requesting their cooperation in the exercise and a date and time for the focus group meeting was set.

Question Development

The principal investigator developed the initial questioning route for the focus group questionnaire guide prior to traveling to Uganda for the actual study (Appendix D). Open-ended questions were created based on the study objectives and literature review. Probe questions were used after each question to stimulate further discussion, when needed. The first question for the focus group served as an icebreaker. Sets of questions that were asked of the participants addressed their opinions about use of smoked clay, herbal clay, and alcohol during pregnancy. Questions also addressed reasons for using these products. A nutrition expert with experience conducting focus groups at Oklahoma State University reviewed the questioning route and potential probes including the logical and sequential flow of the questions and the ability of the probes to elicit the desired information.

A pilot focus group was conducted to test the questionnaire guide and techniques with a group of women in Central Kampala division who were similar to the study subjects. The results were not included in the subsequent analysis. The purpose of the pilot test was to ensure the effectiveness of the sequential flow of the questions, understanding of each question by participants, adequate time allocation for questioning, and the generation of the desired information targeting the research question (Krueger, 1994). Little revision was made to the questionnaire guide based on the observations and analysis of the pilot group.

Focus Group Methods

The focus group procedures employed were based on the procedures proposed by Krueger (1994). The basic steps followed included developing the questioning guide, training the moderator and assistant, pilot testing the questions, revising the questions, identifying and recruiting the target group, scheduling meeting times, conducting the group discussions, debriefing sessions after each meeting, reviewing new questioning routes, conducting discussions until information was substantially repetitive. Data collection was followed by data translation and transcription, verification of accuracy of transcripts, identification of code words and themes and, lastly reports writing.

Focus groups are a socially oriented research method capturing real-life data in a social environment. This method is flexible, has high face validity, provides speedy results, and is economical (Krueger, 1994). This method of data collection was chosen for this investigation because it provided an effective approach to gathering useful information for exploratory research such as identifying determinants for behavior and

eliciting responses for subsequent use in the quantitative phase (Kok et al., 1996; Morgan, 1993). The group dynamics in most cases expose aspects of the topic that would otherwise not have been anticipated by the researcher and would not have emerged from interviews with individuals (Babbie, 2001). For the present study, focus group discussions were conducted to determine women's beliefs, perceptions, and knowledge about consumption of smoked clay, herbal clay, and alcohol during pregnancy and the effects of consumption of these products on the mother and her infant.

Four focus group discussions were conducted with seven to twelve participants (Figure 1) until there was substantial repetition of information (Krueger, 1994). According to Krueger (1994) a minimum of three focus groups are sufficient if the sample population is comparable with respect to social, ethnic, and geographic characteristics.

Focus Group Staff

Focus group staff consisted of a moderator and an assistant. The moderator of the focus groups was a male sociologist who was Ganda with experience in conducting focus groups. The main investigator served as the assistant. The assistant made sure that the two tape recorders employed were on and changed the tapes as needed. The assistant also took notes and observed non-verbal interaction.

Prior to the focus group meetings in Uganda, the principal investigator participated in a focus group study and in a focus group training seminar where recording and listening to audiotapes was practiced, in addition to studying the procedures outlined by Krueger (1994). Subsequently, this researcher reviewed the procedures outlined by

Krueger (1994) with the moderator and held mock discussions together as part of the training for the focus group discussions in Kampala during the first week of June 2001.

Focus Group Data Collection

The LC I chairmen for each parish scheduled the focus group sessions. On the day of the focus group activity, the LC I chairman organized the participants at the specified meeting time. The meetings were held in community centers such as schools and homes of local leaders. Participants sat in a group on chairs, benches, or floor mats depending on the available facilities in the meeting place. The moderator opened the discussion with a welcome address to the meeting, explained the study extensively, requested the participants' permission to audiotape the discussions, and invited participants to ask any questions. The participants were informed that there were no wrong or right answers to the questions and that their opinions were highly valued. The questions were asked so that each participant had a chance to give her opinion (Appendix D). Participants gave verbal consent to participate in the study and participants completed demographic questions (Appendix E) in a face-to-face interview with the moderator and assistant. The procedure took approximately 10 minutes to complete.

Focus group discussions were conducted until responses were repetitive across focus groups. The moderator encouraged responses and directed the discussion to the relevant topic at hand. The discussions were audiotaped in duplicate to ensure accurate collection of all the information sought. At the completion of each focus group, participants were given a bar of laundry soap, a small amount of money that could buy a loaf of bread, and thanked for their participation in the appropriate manner based on the Ganda culture.

After each meeting, the pair of audiotapes were spot checked for effectiveness in capturing discussion by fast forwarding and playing in several places (Krueger, 1994). Debriefing sessions were held between moderator and assistant following each group discussion to compare their perceptions of the group discussions. The audiotapes were transcribed verbatim into Luganda and translated to English by the moderator. The assistant listened to the audiotapes and read over the transcripts to ensure accuracy. The assistant completed summaries of the group discussions. Notes that were taken by the assistant moderator during the discussions were used to supplement transcribed data, e.g. responses were unanimous, disagreement among subjects, and uncertainty about information.

During the focus group discussions, the assistant moderator noted the following:

- changes in the questioning route and participants' characteristics.
- new avenues of questioning were considered in following focus groups such as: elimination, revision, or addition of questions.
- consistency between participant comments and their reported behaviors.
- descriptive phrases used by participants as they discussed key questions.
- descriptions of participant enthusiasm.
- themes in responses to the key questions.

Data Analysis

Qualitative techniques based on the Grounded Theory Method by Corbin and Strauss (1990) and Krueger (1994) were employed to analyze the data. An inductive approach

was used to identify the beliefs, knowledge, and practices regarding smoked clay, herbal clay, and alcohol use during pregnancy.

The main investigator reviewed the printed transcripts for accuracy by listening to and reconciling information with the tapes. Corrections were made to the transcripts. Minimal errors were found. Potential trends and patterns were noted and extracted from the printed transcripts of the focus group discussions. The analysis sheet (Appendix F) was adopted from Krueger (1994) to identify notable quotes.

The constant comparative method (Strauss and Corbin, 1990), a type of content analysis was used to analyze the data. The analysis involved identifying concepts in the data, placing the data into relevant categories, and assigning properties to categories (Strauss and Corbin, 1990). Comparisons were made across text segments to identify and develop categories. To achieve the categorization, the researcher looked for similarities and differences in the text segments. One researcher coded and analyzed the transcripts to capture the utterances or text segments. After reading the transcripts several times, utterances for each group that were similar were cut and placed on 5"x8" cards. The cards from all groups were sorted based on similar text segments.

A list of code words or phrases was developed to identify text segments. In this technique meanings were assigned to words derived from the text segments according to common cultural usage or experience (Strauss and Corbin, 1998). Because terms used are subject to many interpretations, specific definitions were clearly specified (Appendix G). Finally, a summary of the group discussions and the researcher's highlights and impressions of all focus group discussions was prepared. No intra-coder reliability was calculated. Hence there may be bias in coding.

Study 2: Interviews with Newly Delivered Mothers

The researchers developed a survey exploring women's beliefs, perceptions, and consumption of smoked clay, herbal clay, and alcohol. An interview with open- and closed-ended questions was orally administered in the Ganda language to 70 women who were purposely recruited after delivery in two maternity wards at Mulago Hospital in June 2001.

Newly delivered mothers were selected because they could recall and report in depth and breadth their experiences about use of smoked clay, herbal clay, and alcohol during their recent pregnancy. The selection criteria included mothers from the Ganda ethnic group aged 18-39 years that gave birth to a live child at Mulago Hospital less than one week before the interview and before hospital discharge. Women who had a premature delivery or known medical condition such as severe pain after caesarean section, AIDS, and fever were excluded from the study. Screening for poor health was based on a brief inquiry by the interviewers about the patient's health at the hospital bedside.

Subject Recruitment

Senior midwives in charge of labor wards and antenatal units assisted in the recruitment of the newly delivered mothers. Mothers were approached in person by the interviewers to solicit their participation in the study. The mothers gave verbal consent to participate in the interviews; written consent was not culturally appropriate as women considered it a binding contract.

Materials and Instrumentation

A survey of open- and closed-ended questions based on the literature review with some questions adapted from the Oklahoma Pregnancy Risk Assessment Monitoring System (PRAMS) questionnaire was employed (Appendix H). PRAMS is an ongoing national population based surveillance of selected maternal behaviors that occur before and after pregnancy including experiences of complications during pregnancy and their use of health services (Centers for Disease Control and Prevention (CDC), 2002A). Additional items adapted from the Third National Health and Nutrition Examination Survey (NHANES III) questionnaire on the alcohol consumption were added (National Center for Health Statistics, 1994). The present study employed recommendations on measures of evaluation and design of knowledge (Parmenter and Wardle, 2000). According to Parmenter and Wardle (2000), it is important to use existing measures and pilot studies in developing surveys, including consideration of the content, structure, and statistical evaluation. The questionnaire was administered in Luganda, the ethnic language of the women.

Pilot Study of the Survey

Two pilot studies were conducted during the months of May and June 2001. In the first pilot study, 8 African mothers who currently reside in Oklahoma completed a self-administered questionnaire and reviewed the questionnaire for time to complete, clarity, and relevance of questions to the specific population. Few changes were made to the questionnaire based on the suggestions by the reviews of the African mothers. This pilot study served to test the instruments' appropriateness for the study and ensure the

respondents' ability to perceive and respond to the questions correctly. The second pilot study was conducted with 10 women who recently gave birth at Mulago Hospital and shared similar characteristics with the sample population but were excluded from the eventual study. Again a few survey items were modified for appropriateness, correct perception of questions, clarity, and the time taken to complete the oral interview.

One professor and four students in the Department of Nutritional Sciences at the Oklahoma State University evaluated face validity (the quality of an indicator that makes it seem a reasonable measure of some variable) and content validity (the degree to which a measure covers the range of meanings included within a concept) of the questions (Babbie, 2001; Portney and Watkins, 2000). A sociologist and midwife evaluated the content validity of the questionnaire in Uganda during June 2001.

After pilot testing and verifying validity, the final questionnaire included 59 questions about geophagy and demographic characteristics. Based on the results from the focus groups, questions referred to the smoked clay and herbal clay used during pregnancy as "bumba" and "mumbwa," respectively. The terms are derived from Ganda. The term "bumba" refers to a piece of smoked dried clay that is mostly broken into pieces (tablets) and chewed or sucked by pregnant women. The term "mumbwa" refers to a mixture of a variety of herbs with clay that is molded into a cylindrical shape with tapering ends. The herbal clay is ground into a powder, measured into a glass and mixed with water to form slurry before drinking (Abrahams, 1997). Some herbal clay is similarly eaten in tablet form like the clay.

Interview Staff

A male Ganda sociologist and female nurse-midwife with previous experience conducting personal interviews were employed to conduct the interviews. The two interviewers were trained to conduct the face-to-face interviews to assure consistency of procedures across the sample of mothers interviewed. Training included reading the questions, discussing their translation from English to Luganda, and practicing asking the questions to reduce inter-interviewer differences and increase consistency. Identifying the correct alternatives on the survey minimized interviewer bias in interpretation of responses. Understanding of the coding of responses to open-ended questions was improved by identifying the range of responses given in the pilot study.

Data Collection

To obtain informed consent, study procedures were communicated to participants. Participants were informed that their participation was voluntary and were free to withdraw at anytime. Interviews were conducted daily from 9:00 am to 3:00 pm, at the hospital bedside of the mother following the delivery of their infant. The interviews were conducted for two weeks until the sample size of 70 was achieved. The interviews took approximately 45 minutes to complete. One bar of washing soap and a token amount of money worth a loaf of bread were given to the mothers as appreciation for their participation.

Data Analysis

SPSS 11.0 for Windows (2002) was employed for all statistical analyses. Frequencies and means were used to describe the sample data. The reporting of the presence or absence of alcohol intake was assessed because of difficulty in assessing the differences in the alcoholic content, types of alcoholic beverages, and quantities consumed by the women.

Content analysis was used to analyze the qualitative data from open-ended questions (Berg, 1998). Newly delivered mothers' responses were coded based on the similarity in utterances or text segments. Each text segment was written on a separate sheet with the appropriate code word. The sheets were sorted and grouped based on the similarity of utterances or text segments.

Study 3: Survey with Health Care Providers

Healthcare providers from Mulago Hospital, a government owned hospital in Kampala, Uganda completed a survey during June and July 2001. One pilot study was conducted with 4 students in the Department of Nutritional Sciences at the Oklahoma State University to ensure clarity of survey questions and the time taken to complete the survey.

Sample Selection

A purposive sample of midwives and obstetricians/gynecologists who worked directly with pregnant women in the antenatal clinic and delivered mothers in the labor ward were invited to participate in the study during June 2001. To be a subject in this

study, the health providers had to be working half or fulltime at Mulago Hospital as a trained gynecologist/obstetrician or midwife. Health care providers who were on vacation, study leave, not scheduled to work during the study period were not included in the study.

Subject Recruitment

Announcements of the upcoming study were made at the gynecology departmental meetings to solicit obstetricians' and midwives' participation in the study. Names of the gynecologists were obtained from the Department of Gynecology. Midwives in charge of the antenatal and maternity ward units were approached in their offices and requested to provide names of midwives. The recruitment letter (Appendix I) contained an invitation to participate in the survey, and explained the purpose of the study and the importance of their participation. The letters and questionnaires (Appendix J) were distributed to medical doctors directly and if the physician was absent, the materials were placed in the physician's mailbox. Midwives in charge of labor wards and antenatal clinics distributed the survey to midwives (Appendix J). Midwives were given a token amount of money and sanitizers for their participation.

Materials and Instrumentation

A survey was developed by the principal investigator to measure the study objectives. The survey was employed to determine health providers' perceptions about nutrition and health-related concerns of pregnant women in Kampala. Specifically, maternal risk behaviors of geophagy, herbal clay, and alcohol consumption were examined. The survey had an identification number in the top right hand corner of the

instrument. A cover letter and survey were distributed with a return self-addressed envelope; the letter requested study participants to complete and return the questionnaire to a specified location in the hospital. Professionals were reminded to return the survey during the meeting. A second survey was distributed to non-respondents two weeks after the initial distribution (Dillman, 2001).

Data Collection Procedures

A modified Dillman (2001) technique was used to distribute the survey. Questionnaires were distributed to 67 health care providers working at the hospital. Returning the completed survey was considered as consent to participate in the present study. A cover letter and survey were distributed with a return self-addressed envelope; the letter requested study participants to complete and return the questionnaire to a specified location. A reminder announcement was made during the meeting on a weekly basis. A second survey was distributed to non-respondents 14 days after the initial survey distribution (Dillman, 2001). Again, questionnaires were distributed with a return self-addressed envelope. Participants were requested to complete and return the questionnaire to a specific location in the department, labor ward, or antenatal clinic units. The subject number on the top right hand corner of the survey was used to track responses and send surveys to non-respondents.

Data Analysis

SPSS software (2002) was employed for all statistical analyses. Descriptive statistics were employed to analyze quantitative data. Chi-square analyses were employed to

determine differences between the obstetricians and midwives on the 10 items of advice given to pregnant women. The frequency of advice and the number of concerns observed in pregnant women were totaled and t-tests were employed to determine difference between midwives and physicians.

Content analysis was employed for qualitative responses to open-ended questions (Berg, 1998). Health providers' responses were coded based on the similarity of the text segments under the main question. Each text segment was written in a table with the appropriate code word. Code words were used to identify text segments. Frequencies of the similar texts were determined and used to describe the data (Appendix K).

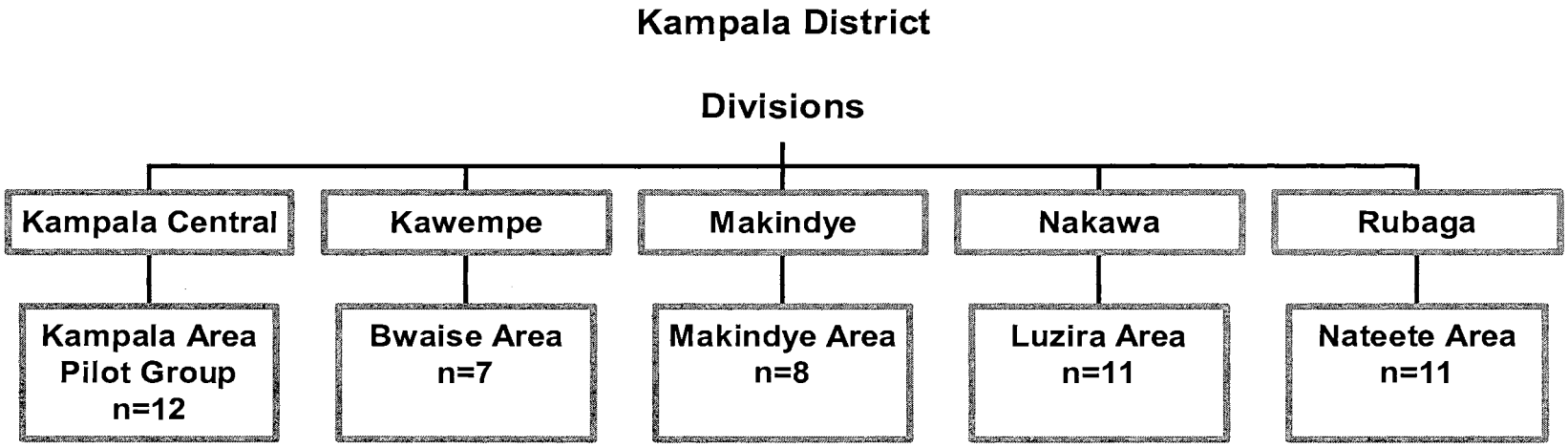

Figure 1. Focus Group Meetings in Kampala District Divisions

CHAPTER IV

CONSUMPTION OF SMOKED CLAY, HERBAL CLAY, AND HERBS IN GRAVID NON-PREGNANT WOMEN IN UGANDA

ABSTRACT

Objective: The objective of this study was to investigate the beliefs and perceptions of clay and herbal clay use during pregnancy in community women in Kampala, Uganda.

Design: Descriptive design employing focus groups.

Participants and Setting: Four focus groups consisted of 37 women in Kampala District in Uganda who had given birth to at least one child.

Variables Measured: Women's beliefs about clay consumption and use of herbs as strategies for coping with pregnancy.

Analysis: Data analysis was done by content analysis.

Results: Women believed consumption of smoked clay was a craving and smoked clay eased nausea and vomiting. Herbal clay and herbs were mainly used as medicine to ensure an easy pregnancy and delivery of a healthy infant.

Conclusion: The findings suggest that women's beliefs of smoked clay and herb use are deeply entrenched and are passed from generation to generation through a network of female relatives and friends.

Implications: Interventions are needed including messages that provide knowledge regarding the possible consequences of excessive use of clay and herbs during pregnancy. Interventions should assist in improving women's knowledge and application of those practices that lead to good maternal health and successful pregnancy outcomes. Messages sensitizing children about eating clay are warranted.

INTRODUCTION

In Uganda and the sub-Saharan region, pregnancy and childbirth are important family events. Family or community members with experience guide young inexperienced mothers in established family practices for pregnancy and childbirth. There are established cultural expectations regarding behaviors to follow during pregnancy and childbirth. These cultural practices may be beneficial but they may also be detrimental to the health of the mother and her unborn child.

Geophagy, the deliberate consumption of soil, has been documented to be a common but an under-reported habit worldwide (Abrahams, 1997). The etiology of clay consumption is unclear. Studies report soil consumption in pregnant women (Geissler et al., 1998; McLoughlin, 1987; Horner et al., 1991; Hunter, 1973). Several authors have reported the widespread consumption of clay on the African continent (Abrahams, 1997; Geissler et al., 1999; Abrahams and Parsons, 1996; Hunter, 1973, Hunter, 1993), however, few studies have been conducted to describe beliefs related to this practice among women of childbearing age (Geissler et al., 1998; Geissler et al., 1999). The present study is the third to examine in detail the practice of geophagy in Africa among women of childbearing age. The present study examines women's beliefs, patterns of use,

and perceived fetal and maternal benefits and/or harm of the practice of geophagy. Use of herbs in pregnancy is also widespread in sub-Saharan Africa (Mbura et al., 1985; Mabina et al., 1997). It is not clear if use of herbs benefits or harms pregnant women (Mabina et al., 1997).

The use of clay and herbs are common, but poorly understood, in women in tropical regions. Hence a more in-depth examination of these practices is needed to shed more light on geophagy and use of herbs, especially in women of child bearing age. Johns and Duquette (1991) proposed the examination of these traditional practices within their own ecological and cultural contexts to illuminate the adaptive aspects of traditional diets and also offer insights into evolution of human dietary and medical behaviors. The present study identified the women's reasons for consumption of smoked clay and herbs and the perceived benefits and harm of consuming these substances for maternal and infant health.

METHODS

Subject Selection: To better understand gravid women's beliefs and perceptions regarding the use of clay and herbs during pregnancy, focus groups were conducted in four of the five divisions of Kampala District in Central Uganda. One division was employed for the pilot group and responses were not included in the present study. Local community leaders assisted in subject recruitment. Purposive sampling was used to select participants who could communicate both depth and breadth of experience (Morgan, 1993). The researchers sought to include participants who represented diversity on selected characteristics, yet had sufficient homogeneity on issues or context upon which

participants could share and build a discussion. Key characteristics for selection included females who had at least one child, were not pregnant, and living in one of four district divisions of Kampala District and were from the Ganda ethnic tribe. This sample was selected in order to elicit information about use of clay and herbs that are commonly practiced (Abrahams, 1997). Abrahams (1997) reported that in Kampala, street vendors sold a variety of soils for use as traditional medicines. Based on the principal investigator's personal experience, geophagy and use of herbs in this ethnic group is a cultural norm, especially during pregnancy. The suburbs of Kampala were selected because a large number of women from the Ganda tribe resided in this location. The Institutional Review Board of the Oklahoma State University and The National Council of Science and Technology in Kampala Uganda approved this protocol.

Materials and Instrumentation: The question guide for the focus group discussion was developed from a literature review. A nutrition expert in conducting focus groups at Oklahoma State University reviewed the questioning route and potential probes including the logical and sequential flow of the questions and the ability of the probes to elicit the desired information on beliefs and perceptions of use of clay and herbs. A pilot test was conducted with 12 women of childbearing age in another division in Kampala, Uganda in June 2001. The pilot test was conducted to ensure the effectiveness of the sequential flow of the questions, understanding of each question by participants, adequate time allocation for questioning, and the generation of the desired information targeting the research question. Minor corrections were made to the question guide.

DATA COLLECTION

In each of the focus groups, information collected from each participant included responses to a series of open-ended questions about the use of smoked clay (bumba) and herbs mixed in clay or herbal clay (mumbwa) during pregnancy. Clay is a sedimentary material with grains smaller than 0.002 mm in diameter; is stiff and sticky and is used to make bricks, pots, and ceramics (Concise Oxford Dictionary, 1995). The Ganda refer to clay as bumba. The bumba that participants consumed in the present study was prepared by kneading and molding clay into a cylindrical block. The block of clay was wrapped in banana fiber and was sun-dried or smoked to introduce flavor. In the present study, this clay will be referred to as smoked clay. Herbs were used as remedies and were obtained from leafy plants grown around the home garden or from traditional herbalists. Herbs can be used fresh or dried. Herbal clay is a mixture of dried clay with one or more types of ground herbs. Herbal clay was kneaded and molded into a cylindrical shape with tapering ends. The Ganda refer to this mixture as mumbwa. Preparation for drinking was by grinding it into a powder and mixing with water to form slurry (Abrahams, 1997). Both bumba and mumbwa can be broken into pieces (tablets) and chewed or sucked by pregnant women.

Questions of interest for this study are in Table 1. A warm up question served as an icebreaker. The Ganda moderator conducted the discussions in the Ganda language. The moderator employed probing for additional information based on participants' responses in each focus group. Focus group discussions were held until no new information was obtained.

Description of Focus Groups: Focus groups were held in places organized by local representatives. Participants' verbal consent to participate in the group discussion was sought and obtained. The group meeting lasted 40-60 minutes. A moderator and an assistant moderator facilitated the focus group discussions. The moderator and assistant had completed training in focus group methodology. The moderator conducted the group interviews and the assistant moderator operated two tape recorders and took detailed notes of the verbal and nonverbal communication of participants.

Data Analysis and Interpretation: Following the meeting of each focus group, the research team discussed and recorded their impressions of the group. Focus group discussions were later transcribed verbatim from the audiotape and were translated into English by the moderator. The assistant listened to the tapes to verify accuracy in translation. Data processing maintained confidentiality by using no names. Data analysis was guided by the grounded theory approach outlined by Corbin and Strauss (1998), as well as procedures for qualitative research (Glaser and Strauss, 1967; Krueger, 1994). The principal investigator read the translated version several times to become familiar with the data and to identify emerging themes by using the processes of constant comparative analysis (Glaser and Strauss, 1967). Through this process, the researcher reduced the material and began to analyze, interpret, and make meaning of the data (Corbin and Strauss, 1990). The texts were coded and analyzed using a content analysis (Berg, 1998).

The aim of content analysis was to provide a broad framework for analysis, organize content of similar responses together, and remove information that was not relevant to the research questions. The principal investigator who assisted in moderating the focus

groups performed this analysis. Transcripts were carefully read for overall content and identification of major codes or categories. Multiple cards were created for each focus group with statements and phrases from transcripts placed directly into established content areas. Cards from all focus groups were sorted based on the similarity in content. Statements that fit into more than one content area were placed under each appropriate area. Codes were identified to describe responses and given definitions. The definitions were the concepts derived from the participants' statements.

Further analysis identified major themes regarding women's beliefs and perceptions of coping strategies during pregnancy. Recurring themes in each focus group that were relevant were coded once because the aim was to gather participants' opinion rather than the frequency with which opinions were mentioned. Eventually, the organized themes were refined to a point where saturation of the data was reached.

RESULTS AND DISCUSSION

Four focus groups discussions were conducted with 37 community women who had given birth to at least one child. The women's age ranged from 20 to 59 years with an average of 28.8 years. All were from the Ganda ethnic group who were living in the suburbs of Kampala. Fifty-four percent (n=20) of the women had primary education, 32% (n=12), had secondary school education, and 13% (n=5) had high school and more. None were college graduates. On average, homes had 2.7 adults (range = 1 to 10) and about 3 children (range = 0 to 20). Sixty-two percent were unemployed. Of the employed, most were vendors, petty traders or bar waitresses.

Themes that emerged during the discussions included strategies employed to have an easy pregnancy and a healthy baby, perceived effects of consumption of smoked clay and herbs, herbal clay during pregnancy, types and sources of soils consumed, patterns of soil consumption.

Strategies Women Employed to Have an Easy Pregnancy and a Healthy Baby: Women employed traditional treatments as a strategy for an easy pregnancy and healthy infant. Most women mentioned traditional treatments such as drinking herbal clay, and bathing and applying topical herbs for infant and pregnancy health. A further exploration of the traditional practices women employed to cope with pregnancy revealed that women mainly consumed clay or soil and some food substances such as raw fruits in response to a craving and/or to ease the discomforts of pregnancy such as nausea, vomiting, and saliva in the mouth, and drank and bathed with herbs to maintain a healthy pregnancy.

Perceptions of Geophagy: Women's perceptions of craving soil were mixed. The craving and consumption of smoked clay or "bumba" was perceived to be a natural and almost universal phenomenon to the women. Women indicated that soil eating was a tradition that had existed in their society but mostly because pregnancy made them crave soil. Women indicated, "Soil can only be eaten when pregnant and soil is almost never eaten when not pregnant but few other women eat it" and "when I feel the urge to eat soil, it is the way I can know that I am pregnant." "After delivery smoked clay is not craved." A few participants indicated consuming soil when not pregnant. Some were not certain if the baby also liked the soil. Some women believed that if they craved smoked

clay or some other substance and did not get it, their child would be born squint eyed. Additionally, women believed that if the craving was not satisfied, it would persist after childbirth.

Reasons for consuming soil included obtaining flavor of smoke or odor of soil after a drizzle of rain, sweet taste, and good feeling or emotional well being in addition to easing nausea and vomiting, and reducing the spitting of saliva. Women's consumption of smoked clay for its smoke flavor was equated to a smoker's addiction to nicotine. One participant stated, "When rain drizzles or falls on the soil on the wall the flavor that comes off is so good that when you smell it you have the urge to eat it." Eating smoked clay for emotional well-being and settling the stomach have been reported by pregnant women in previous studies (Geissler et al., 1998; Horner et al., 1991; Hunter 1973).

We explored women's perceptions of the relation between smoked clay and fertility, smoked clay and nutrition, smoked clay and appetite, and smoked clay and worm infestation. Women denied eating soil to increase fertility; this finding was contradictory to a report by Gelfand (1945). Women were not sure about the nutritional value of smoked clay or the relation between smoked clay consumption and increased appetite or risk of worm infestation. The relation between smoked clay and nutrition may be obscure among these women because they do not consume smoked clay to increase appetite or satisfy hunger pangs. Women mostly mentioned eating smoked clay after meals, thus it seems that women ate soil for emotional well-being or enjoyment. Geissler et al. (1999) found that pregnant women in Kenya ate soil because they liked it, felt nice, it tasted good, and because they were pregnant. Similar to the present study, Geissler et al. (1999) reported that women did not eat soil to satisfy hunger.

Some types of clay analyzed in Uganda were suggested to confer nutritional benefits to consumers who had mineral deficiency (Abrahams, 1997) in amounts close to Recommended Daily Allowances. Uganda clay contained calcium, magnesium, iron, and zinc and therefore these clays could provide an individual with nutrients. Estimated bioavailability of iron from soils in Uganda after extraction with 0.1m HCl ranged from 3% to 42% of the Recommended Nutrient Intakes (UK) for iron for males (Abrahams, 1997). However, bioavailability of iron from clay may be a problem. For example, one clay with 81,696 mg/kg of iron had only 745 mg of bioavailable iron (Abrahams, 1997).

Perceived Effects of Consumption of Smoked Clay: In the present study, women were not certain if worms were contracted from soil consumption or other methods. Geissler et al. (1998) found a similar lack of knowledge in pregnant women on the coast of Kenya.

Other perceived effects of soil consumption by women in the present study were if eaten in excess, the baby would be born matted with clay on the head and skin. However, some women were not certain about the relation between smoked clay consumption and clay deposition on the baby's head at birth because of the separation of the stomach from the uterus. Observations of clay on the baby at birth may be explained by the passage of meconium.

Types and Sources of Soils Consumed in Pregnancy: Sources of soils or clays are varied and easily available. Women mainly obtained and consumed smoked clay from markets and street vendors. They explained that the river valley was the main source of the clays. The clay was dug several feet below the ground, kneaded, molded, sun-dried and/or smoked over a fire to dry and introduce flavor. Other types of soils that women

consumed were soil from the kitchen and bedroom walls, soil from the termite mounds, soil from nests built by insects, and very rarely, soil from trees. Women mentioned that plain soil was only attractive to eat after a drizzle of rain because rain made the soil acquire a flavor that made it irresistible to eat. Women indicated they could not eat any clay or soil because there was no attraction for clay that was not smoked during drying. The majority of women consumed smoked clay during pregnancy.

Reports on type of soil consumed varied. While Geissler et al. (1999) mentioned termite soil as the most commonly eaten soil on the Kenyan Coast, in the present study smoked clay and soil from walls of houses were the most commonly eaten. The differences in the sources of soil may be explained by the lack of active termite mounds in the suburbs of Kampala. Also, in the Ganda ethnic group, clay pottery holds an important place in the culture; special clay pots were made and are still made for the king's palace (Personal communication, June 2001). Thus, this king's pottery may be the foundation of the consumption of smoked clay instead of soil from termite constructions in this ethnic group. The present study adds consumption of insect soil nests to the list of earth materials consumed besides that of soil constructed by termites on trees and wood.

Patterns of Soil Consumption During Pregnancy: The gestational age, duration, and frequency of smoked clay consumption depended on the preferences of the women. Some women ate a little smoked clay at a time; others ate smoked clay all day and night, others consumed smoked clay throughout pregnancy, while a few women did not consume clay. Women who had increased saliva production and nausea stated they ate smoked clay all day. It seems that pregnancy condition dictates the frequency and amount of smoked clay consumed. Some studies estimated the amount of clay ingested but did not describe the

pattern of eating clay in relation to mealtimes (Geissler et al., 1998; Geissler et al., 1999; Hunter 1993). Women in the present study reported eating smoked clay in varying amounts and frequency throughout out the day.

Smoked clay was consumed any time before, during, or after meals but mainly after meals. One participant mentioned that a visit to homes would reveal cup holes in the kitchen and bedroom walls constructed from mud-and-wattle, where women constantly pinched soil during cravings or times of gastrointestinal discomfort during pregnancy. The amount of smoked clay consumed varied among the participants, with some indicating that they could consume 25 g of clay a day to consumption of a block weighing 1,000 g in 2 to 4 days giving a daily average of about 250 g per day. The cost of smoked clay was indicated as a factor in how much one could eat because 25 g of clay cost Shs. 100 and a block cost Shs. 1,500 (approximately one dollar) which is equivalent to an average day's wage or two loaves of bread. It was not possible to determine how much clay women ate from the mud-and-wattle walls.

Some studies suggested that consuming clay in large amounts could replace food intake or decrease the bioavailability of important minerals (Wiley and Katz, 1998). Diets in Uganda are mainly plant based. According to several studies, plant based diets decrease the bioavailability of calcium (Heaney, 1990; Heaney, 1988), iron and zinc (Zijp et al., 2000). The combined use of clay and plant diets may compound the problem of iron deficiency present in pregnant women (Ministry on Health, 1999; Kiwanuka et al., 1999). Clay may also replace nutrient-rich food in the woman's diet.

Herbal Clay Use for Pregnancy and Infant Health: In addition to the use of smoked clay, the majority of participants used herbs and herbs mixed with clay (herbal clay).

Participants gave local names to several herbs that they used alone or as mixtures in clay during pregnancy (Table 2). Some participants said they were aware of the functions herbs conferred on the practitioner but were not willing to share this information for fear of "selling their treatments or secrets." Women's perceived benefits of use of herbal clay during pregnancy included the cleansing of the baby's skin of 'dirt' (vernix), promoting general good infant health, increasing the baby's ability to move in the womb, and treating an after birth skin condition called "enoga noga." Noga noga was believed to be a skin condition due to syphilis infection.

Several benefits were indicated for early and late maternal use of herbs. Early use of herbs was associated with maternal strength and good health while later use of herbs was mainly associated with childbirth. Women believed that use of herbs during the seventh month of gestation helped loosen the pelvic bones thereby facilitating easy delivery. Herbs ('kanguya,' meaning to quicken) used during the end of gestation were believed to induce and enhance labor contractions and lead to quick delivery. The trust in herbs and use of herbs by women as medicine may lead to reduced use of health care services. Mbura et al. (1985) reported that a fear of health services was the reason women used herbs.

Herbs were ground and mixed with clay, kneaded, molded, and subsequently sun-dried. The dried herb-clay solid was ground into a powder that was mixed with water to form a cloudy mixture before drinking. The cloudy mixture of herbal clay was substituted for drinking water to be used when thirsty. Herbs alone were crushed and mixed with water and used as a drink to quench thirst or were used as a bathing solution. Women claimed that there was no overdose from the medicine in the herbs. Women stated that

herbs had no nutrient benefits. Using herbs alone and mixing herbs with clay may influence the effects of each in a unique way and needs further examination.

Women indicated that the beliefs and practices around herbs existed in their society and were passed down by female family members and friends (cultural traditions). As cultural traditions of pregnancy, older family members and other women with experience trained younger women into these cultural roles. An older participant stated that, "Like these girls are all young, I teach them by washing their babies with 'kyogero' for a week and by the end of the week, they have learnt and can also teach others. It is like a chain. We do not go to schools to learn that." Another participant stated, "Friends teach you if one has no parents or close family members. It is like going to the doctor and he prescribes Septrin, so when your friend falls sick you just tell her that I took Septrin and got cured."

The results of this study are limited in that regional and cultural differences may influence maternal practices during pregnancy. A convenience and small sample were employed. Results may not be representative Ganda women of childbearing age in Kampala District. However, these data could be useful in investigating the practices of smoked clay and herbal clay use in other female populations in Uganda. The validity of self-report measures of use of clay and herbal clay may bias study findings. Social desirability may have played a role in the responses of the participants in the present study. These community women were from the same social group and freely expressed themselves about their use of clay and herbal clay. It is possible that their responses may over report data about clay and herbal clay if it was seen among the peers to enhance their social standing and acceptance. No intercoder reliability was determined for content

analysis. Reliability could be increased by use of computer software such as Ethnograph for content analysis. The translation of the questions and responses from English to Ganda and vice versa may have resulted loss and/or misrepresentation of information. The use of a male as moderator may have influenced women's responses.

In summary, the concept of having an easy pregnancy and a healthy baby was fairly consistent across groups and was described in terms of specific traditional practices, and perceived reasons and benefits of these practices. Women perceived that smoked clay and herbal clay were used as normal routine practice during pregnancy. Women consumed smoked clay because of a craving. Women indicated using herbal clays based on the recommendation of a friend or relative that used the smoked clay or herbs, no other proven ability was required but that the person used the herbal clay and it worked.

Implications: A further investigation of beliefs about pregnancy and childbirth is warranted. Further research is needed to determine the effectiveness and dose responses of clay and herbs. There were some negative connotations with traditional practices. Women reported practices that may pose risks of infection and toxicity to infants such as the administration of herb mixtures as a topical or oral medication. Traditional prescriptions and management of pregnancy, labor, and childbirth may be associated with low compliance and reluctance to use modern health services, and delay the recognition of pregnancy complications that incapacitate or kill. Interventions are needed including delivery of messages that convey the possible consequences of excessive use of smoked clay and herbs during pregnancy. Interventions should assist in improving women's knowledge and application of those practices that lead to good maternal health and

successful pregnancy outcomes. This study also provides a starting point to deliver messages about clay and herbs to young women in the community and in school settings.

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Table 1. Focus Group Questions

I. OPENING QUESTION

As we go around the room, please give your name and briefly tell us a little about yourself.

Probe: For example, where do you live and how many children you have.

II. GENERAL QUESTIONS ABOUT PREGNANCY

The first thing we want to talk about is "As mothers how important is having an easy pregnancy.

Probe: On a scale of 1 to 10 how much value would you say you place on having an easy pregnancy?

(1=little, 10=a great deal) Show participants the scale.

1. The first thing we want to talk about is "As mothers how important is having a healthy baby.

Probe: On a scale of 1 to 10 how much value would you say you place on having a healthy baby? (1=little, 10=a great deal) Show participants the scale.

2. What do you think are some of the things a pregnant woman has to do in order to have a healthy baby?

Probe: What are some of the good things you have to do to have a healthy baby?

III. GEOPHAGY

FGQ1. Let's talk about certain traditional practices that women follow to have a healthy baby or an easy pregnancy.

Probe: What are some of these practices? How helpful are these practices? How did you learn about these practices? From whom do you learn these practices?

FGQ2. Some women crave and may eat substances like clay, stones, young mangoes, starch, or ice, during pregnancy, what are your opinions about these behaviors among pregnant women?

FGQ3. First let us talk about the consumption of clay/bumba by pregnant women.

During what period of pregnancy does a pregnant woman start using clay/bumba?

Table 1. Continued

Probe: What are some of the reasons women eat clay or soil or the things that I have mentioned? Is this clay or soil obtained from any particular place? Does it have to be a special type of clay? How much of this clay can a pregnant woman eat on a daily basis? Is this clay prepared in a special way? Is there anything that is added to the clay that will help a woman during pregnancy? What is added? How does it help a pregnant woman?
FGQ4. Next let us talk about the consumption of herbal clay/mumbwa by pregnant women. During what period of pregnancy does a pregnant woman start using herbal clay/mumbwa?
Probe: What are some of the reasons women eat herbal clay/mumbwa? Is this herbal clay/mumbwa obtained from any particular place? How much of this herbal clay/mumbwa can a pregnant woman drink on a daily basis? Is this herbal clay/mumbwa prepared in a special way? Is there anything that is added to the herbal clay/mumbwa that will help a woman during pregnancy? What is added? How do herbs added help a pregnant woman?

Table 2. Herbs Used for Easy Pregnancy and Health of Baby

Herbs for bathing	Herbs for drinking
Akabombo akatono	Akasambandege- softens (Kugonza) Can be ground, mixed with a body cream (Vaseline), and applied on the abdomen
Akafugankande	
Akakubajili	Ekiga mbansole - used from the 8th month
Akakumiliza	Ekisambandege – steamed, ground and strained, and used only once during pregnancy starting at 6th month of pregnancy.
Ebombo	
Ekibwankulata	Ekitonto - used from the 3rd month
Ekirarankuba	Emumbwa or herb clay used from the 3rd month or 7th month of pregnancy depending on maternal needs
Ekireka (Yellowing banana leaf)	
Jirikiti	Kaseke mbogo
Kyogero	
Magejo	
Mubiri	
Mwolola	
Nalongo	
Namirembe	
Olweza	

CHAPTER V

BELIEFS ABOUT ALCOHOL CONSUMPTION AMONG WOMEN OF CHILDBEARING AGE IN UGANDA

ABSTRACT

Objective: The objective of this study was to investigate the beliefs and knowledge of effects of consumption of alcohol during pregnancy.

Design: Descriptive design employing focus groups and individual interviews.

Participants and Setting: Four focus groups with 37 women in the community who had given birth to at least one child and individual interviews with 59 mothers who recently delivered in the hospital.

Variables Measured: Women's beliefs pertaining to alcohol consumption during pregnancy.

Analysis: Content analysis of focus group responses and descriptive analysis of responses to interviews.

Results: Women believed that the consumption of 'waragi,' a local crude distillate or gin from molasses, cleaned the fetus of dirt. Locally fermented brews made from banana, maize, and millet were believed to increase the baby's size and result in a healthy baby. Few women believed that alcohol may harm the unborn infant.

Implications: Consumption of alcohol by pregnant women appears to be dictated by

social factors and lack of knowledge of effects of alcohol. Interventions should increase women's awareness of the maternal and fetal consequences of use of alcohol during pregnancy including the possible causes of meconium passage at childbirth. Health providers should discourage alcohol use during prenatal care visits. There is need for public health messages about the long term social and development issues of individual affected by prenatal alcohol exposure.

INTRODUCTION

Alcohol consumption during pregnancy has been documented to have adverse pregnancy outcomes (Single and Rohl, 1997; Streissguth, 1994, May et al., 2000; Glasser, 2002). Children that are prenatally exposed to heavy amount of alcohol exhibit a cluster of anomalies called fetal alcohol syndrome (FAS) (Jones and Smith, 1973). These effects were identified as fetal growth deficiency, specific morphological abnormalities including characteristic facial features and mental retardation (neurobehavioral abnormalities of the central nervous system) (Jones and Smith, 1973; Cornelius et al., 1999; Jacobson et al., 1996). Binge drinking was indicated to be more harmful to brain development during critical stages of development than other patterns of drinking (Maier and West, 2001). Moderate alcohol consumption during pregnancy has been associated with increased risk of features similar to FAS (Jacobson and Jacobson, 1999), preterm delivery, low birth weight, and spontaneous abortions (Lundsberg et al., 1997). Due to variations in drinking patterns, maternal metabolisms and genetic susceptibility, timing of alcohol consumption during pregnancy, and vulnerability of the various brain areas, there

is no established safe level of alcohol consumption during pregnancy (Maier and West, 2001).

In Uganda, there appears to be no documented research on consumption of alcohol among women of childbearing age or during pregnancy. Alcohol appears to be a commonly used substance in the general population (Uganda Lecture, 1999; African Studies Center, 2002). Alcohol is mainly used for social purposes in rural and urban settings. Society considers that women should drink alcohol moderately or abstain from alcohol intake while it is more acceptable for men to drink. No research has specifically investigated the perceptions and beliefs of Ugandan women in their reproductive years about alcohol consumption during pregnancy. This study reports the qualitative and quantitative results that describe perceptions and beliefs of alcohol consumption among women 19-59 years old in Uganda. The objectives of the present study were to investigate retrospectively the use of alcohol during pregnancy, women's knowledge of fetal alcohol effects, and reasons for participants' alcohol use during pregnancy.

METHODS

The study protocol was approved by the Institutional Review Board at the Oklahoma State University, the National Council of Science and Technology in Kampala Uganda, and Mulago Hospital Administration.

Focus Group Discussions

Subject Selection for Focus Group Discussions: A purposive sample of females who were 19 years and older, had at least one child, were not pregnant, were from the Ganda

ethnic group, and resided in Kampala District in Central Uganda were selected. Participants were selected who could communicate both depth and breadth of experience (Morgan, 1993). Subjects were recruited in suburbs of Kampala through their local area government representatives. Thirty-seven mothers participated in four focus group discussions. One participant was ineligible because she was pregnant and another was younger than 19 years old. These subjects were thanked for their interest and given the appreciation package of money and bar soap and were asked to leave.

Materials and Instrumentation for Focus Groups: The question guide for the focus group discussion was developed from a literature review (Table1). A nutrition expert in conducting focus groups at Oklahoma State University reviewed the questioning route and potential probes including the logical and sequential flow of the questions and the ability of the probes to elicit the desired information on beliefs and perceptions of use of alcohol. A pilot test was conducted with 12 women of childbearing age in another division in Kampala, Uganda in June 2001. The pilot test was to ensure the effectiveness of the sequential flow of the questions, understanding of each question by participants, adequate time allocation for questioning, and the generation of the desired information targeting the research question. Minor corrections were made to the question guide.

In each of the focus groups, a series of questions was asked pertaining to alcohol consumption in pregnancy (Table 1). A warm up question initiated the discussion. Questions of interest for this study included the following: "How much do you think it is safe for a woman to drink alcoholic beverages during pregnancy? Of the available alcoholic drinks, which type is safe for a pregnant woman to drink? How much alcohol do you think is safe for a woman to drink during pregnancy? Are there times when it is

safe for a pregnant woman to drink alcohol? Are there any good reasons why a pregnant woman should drink alcohol? What are some of the things that can happen to you or the unborn baby if a woman drank alcohol?" Focus group discussions were held until no new information was obtained.

Data Collection for Focus Groups: Focus groups were held in central locations organized by local government representatives. A moderator and an assistant moderator facilitated the focus group discussions. The moderator and assistant completed training in focus group methodology. The moderator, a male sociologist, had conducted numerous focus group discussions for a variety of research projects in Uganda. The moderator conducted the group interviews and the assistant moderator operated two tape recorders and took detailed notes of the verbal and nonverbal communication of participants. Probes were employed to obtain additional information on topics that emerged and to clarify ambiguous comments. Participants' verbal consent to participate in the group discussion was sought and obtained. The group meetings lasted 40-60 minutes. Following the meeting of each focus group, the research team discussed and recorded their impressions of the group.

Data Analysis for Focus Groups: Data processing maintained confidentiality by using no names. Data analysis included identification of emerging themes across focus groups. First audiotapes were transcribed verbatim and translated into English by the moderator. To verify accuracy, the principal investigator serving as assistant, who spoke fluent Ganda, reviewed the transcripts against the tapes. Broad themes that emerged from each focus group were assigned identifiers. For example "craving" was assigned to statements

provided as reasons for consuming alcohol, for example women stated that the smell of alcohol gave them the urge to drink it. Similar statements from each focus group were grouped to provide themes and subthemes. The principal investigator recorded all relevant statements from each transcript under the corresponding theme and subtheme. Based on this preliminary structure, codes words were developed and defined based on the meaning and context of the discussions. Quotes that identified the relevant themes were identified. Themes that emerged from the data were reviewed and all statements related to consumption of alcohol, reasons for consuming alcohol, and perceptions of the effects of alcohol on the mother and fetus were identified.

Individual Interviews

Subject Selection for Individual Interviews: In a second part of the study, 59 mothers 18-39 years old were recruited to participate in the study. Women were included in the study if they were newly delivered mothers who gave birth at Mulago Hospital, to a live infant at full gestational age less than one week before the interview. Newly delivered mothers were selected because they could recall and report in depth and breadth their experiences about use of clay and herbs during their recent pregnancy.

Materials and Instrumentation for Individual Interviews: The questionnaire for the mothers was adapted from the NHANES III survey (National Center for Health Statistics, 1994). The survey was pilot tested with a similar group of women. The questionnaire was translated from English to the local Ganda language by a two interviewers (the sociologist and nurse-midwife) and the principal investigator. Two trained interviewers conducted the individual interviews. Training included reading and understanding the

questions and practicing asking the questions to reduce inter-interviewer differences and increase consistency. The questionnaire included three open-ended questions to elicit further information about alcohol.

Data Collection for Individual Interviews: Data were collected daily at the maternity ward between 9.00 a.m. and 3.00 p.m. for two weeks during June 2001. Interviews were conducted within 24 hours for normal delivery, by the bedside of women. Interviews with women who delivered by cesarean section were conducted within one week of delivery of the infants.

Statistical Analysis for Individual Interviews: SPSS 11.0 for Windows (2002) was used for analyses. Frequencies and means were used to describe responses. Content analysis was used to analyze qualitative responses of newly delivered mothers.

RESULTS

Study Participants: The demographic characteristics of the sample are in Table 2. Four focus group discussions were conducted with 37 community women (an average age of 29 years) who had given birth to at least one child. All were members of the Ganda ethnic group and lived in Kampala District. Most women had only a primary education and were unemployed. Of the employed, most were vendors, petty traders or bar waitresses. Newly delivered mothers were about 23 years old, about half were married and most were employed. Most mothers had a primary or secondary school education.

Results of Individual Interviews with Newly Delivered Mothers

Maternal Alcohol Consumption: Alcoholic beverages consumed by women are in Table 3. Table 4 indicates maternal use of alcohol before and during pregnancy. About 40% of the women reported using alcohol before pregnancy. Ten percent fewer women reported consuming alcohol during early pregnancy. Just nine women reported alcohol intake during late pregnancy.

Maternal Perception of Safety of Alcohol Consumption: Mothers were asked to indicate the stages of pregnancy they thought were safe to drink alcohol. The majority of the women did not know at what stage of pregnancy it was safe to drink alcohol. About equal numbers of women indicated that it was safe to drink in early or mid pregnancy with equal numbers indicating safety of alcohol use throughout pregnancy or late pregnancy.

The frequency of safe alcohol use was examined (Table 4). Almost half of the women correctly stated that no amount of alcohol intake was safe during pregnancy. Most women were unaware of the effects of alcohol and Fetal Alcohol Syndrome.

Perceived Effects of Alcohol Use During Pregnancy: Responses to an open-ended question about the effects of alcohol on the fetus are in Table 5. Premature delivery and miscarriage, brain damage, poor infant health, low birth weight, and infant mortality due to falls were the most commonly mentioned effects resulting from prenatal alcohol exposure.

Prenatal Advice about Alcohol Given by Health Providers: Women indicated the health care provider they recently visited with the majority (78%) visiting the midwife. Table 6 indicates practitioners' advice about alcohol that women received during prenatal care visits. Over half of the women indicated they received advice from their health care providers about maternal and fetal effects of alcohol (Table 6). About half of the women reported that they were instructed by their health care provider to cut down or eliminate alcohol intake during pregnancy.

Maternal Beliefs about Alcohol: Responses to the beliefs about alcohol during pregnancy are in Table 7. Most mothers believed that hard liquor was more harmful to the fetus than beer or wine; reducing alcohol consumption would reduce the risk of brain damage; the fetus was vulnerable to the harmful effects of alcohol throughout pregnancy; and waragi cleaned the baby. About half of the women believed that it was wise to refrain from alcohol when planning to get pregnant. Forty percent of mothers were not sure about alcohol's harmful effects during early pregnancy. Most women correctly believed that the consumption of alcohol could affect successive pregnancies if previous babies exposed to alcohol were normal.

Key Themes from Participants in the Focus Groups

Typical Alcoholic Beverages Consumed in Pregnancy: Women indicated the frequency with which they consumed alcohol during pregnancy. Women reported daily consumption of alcohol during pregnancy. Very few women reported they did not drink alcohol during pregnancy. Some women mentioned that they started drinking after conception. One participant stated "for me I drink waragi on every pregnancy. I usually

do not drink waragi but I crave it for a while when I am pregnant and once I deliver, I do not drink any at all."

Most women consumed several locally brewed alcoholic beverages such as "tonto," "kwete," "malwa," "endiga," and "waragi" (crudely distilled gin) and industrially processed alcoholic beverages such as beer lager and Uganda Waragi (Table 2). The types of alcoholic beverages depended on personal preference, and one participant stated, "I would think everybody has her own type of alcoholic beverage they drink," "the one who likes waragi cannot be told to drink beer, it depends on the individual."

Reasons for Alcohol Consumption in Pregnancy: Most women admitted drinking alcohol for a variety of reasons including fetal benefits, craving, health reasons, thirst, personal preference, and sleep purposes. The majority of the participants agreed that consumption of the alcoholic beverage waragi during pregnancy had beneficial effects. Participants believed that when the pregnant woman drank waragi, it cleaned the fetus. In other words, the baby was born clean with no "dirt" (perhaps vernix caseosa or meconium). Vernix caseosa is a cheesy white substance that covers the baby's skin at birth. The vernix is secreted by the sebaceous glands around the 20th week to protect the baby's skin from the amniotic fluid (Dorland's Pocket Medical Dictionary, 1995; BabyZone, 2002). Passage of meconium before birth may be a sign of fetal distress. Meconium aspiration may result in respiratory problems (BabyZone, 2002). Several participants indicated that they heard about the "baby cleansing ability" of waragi from friends. The women stated that as an experiment, they drank waragi and found that their babies were "clean" at birth. The women indicated that they drank the gin with subsequent pregnancies to get a clean baby and to avoid abuse from the midwives at

delivery. As a side issue, the women's explanation was that midwives were abusive if babies were born with dirt (perhaps vernix or meconium). The lack of vernix from the newborn infant may mean that the infant was born at full term (BabyZone, 2002). It appears that some women perceived alcohol intake as contributing to a successful pregnancy outcome.

Most women mentioned that they drank alcohol during pregnancy because they craved it. Statements such as "everybody just craves it, like you crave for waragi," " I do not always drink but when I become pregnant I always want to drink kwete," "Pregnant women drink alcohol because they crave it like they crave clay, the craving ceases after childbirth." One stated, "It is just a craving because after birth you might not drink it again," and another stated, " there are those women who drink as soon as they become pregnant but this always depends on the individual." Other participants felt that when they were in the presence of alcohol, the alcohol odor urged them to drink some.

Some women also stated that they drank for health reasons "if you are pregnant and your health is not very good you have to drink a little." Women did not give any explanation for this behavior.

Thirst was another reason women gave for drinking alcohol. One woman stated, "One may feel thirsty and drink a bottle of beer." Other participants mentioned that they did not have any reason for consuming alcohol. One stated, "We do not know the reason because if you may not be drinking alcohol when you are not pregnant and when you become pregnant, you start drinking." This was not further clarified.

Perceived Safety of Alcohol Consumption: Participants indicated that it was safe to drink alcohol at any stage of gestation. One participant stated that, "You can drink even if

you are one week pregnant or are about to deliver. Alcohol can be drunk anytime. If you are going to deliver you first take a drink and even if you have delivered, you can take a drink."

A few participants indicated that the consumption of alcohol held no benefits, "alcohol is just a drink" a drink that you drink until you just feel dizzy (mild intoxication)." When participants were asked about the safety of amount of alcohol to consume, participants indicated one may get weak with alcohol and were cautioned to drink a little. Participants were aware that the quantity one could drink depended on a person's tolerance of alcohol. However, most participants indicated that there was no harm from alcohol intake. One stated that "you cannot even miscarry", another, "You cannot even fall because if you are drunk, your friends can hold you," and yet another stated and drew laughter, "I have never seen a pregnant woman who got drunk and fell by the road side, I have just heard it from here!" Other participants mentioned seeing drunk pregnant women who fell but they never miscarried and only delivered healthy babies. The majority of participants supported statements that "women come to bars to drink and go to deliver" and "alcohol has no effect on the mother". Again women seemed to associate having a healthy infant with alcohol consumption.

Most women did not know what effect alcohol would have on the unborn baby. They believed that waragi might harm the baby but not the other alcoholic beverages. One cited an incident of a woman that drank waragi daily and delivered an infant with a rough skin and wrinkles. They also believed that a drunken woman might fail to push the child during labor, however, this was discounted by the fact that women who were not drunk also failed to deliver. The most commonly cited consequence of consuming alcohol was

miscarrying the unborn child. However, most women did not believe that drinking could result in miscarriage. Drinking companions were counted upon for help and "God has a way of helping drunk pregnant women."

Participants did not associate alcohol consumption with pain relief. When asked if alcohol provided pain relief or prevented miscarriage, participants laughed. Participants stated, "No local medicine can prevent pains of labor," "only herbs molded in clay can prevent miscarriage or a visit to the hospital." Participants mentioned, "The only medicine in the local medicine is for speeding childbirth." It was also indicated that women did not drink to alleviate pain. However participants agreed that some women drank to get sleep as stated by participants, "There are women who do not have a lot of sleep and drink alcohol to get sleep," and "such women are few because most pregnant women have a lot of sleep."

DISCUSSION

Results reveal that women in the community (focus group discussions) and newly delivered mothers in the maternity wards (individual interviews) seemed to have slightly different responses and views about the effects of alcohol. Women in the community freely expressed opinions about their practices of alcohol consumption. Social desirability may have played a role in the responses of the women. Focus groups are socially oriented and the women may have over-reported their participation in the practices such as alcohol drinking. Prestige may me associated with affording alcoholic beverages. On the other hand, newly delivered mothers may have under-reported the

practice in alcohol intake and over-reported the advice they received from health care professionals especially if they thought that the interviewers were health professionals.

Overall, it seemed that newly delivered mothers were more aware about the effects of alcohol on the fetus than community women in focus group discussions. These slight differences may be due to education and/or health seeking behaviors of the two groups. We did not conduct analyses to examine differences in education, however, more newly delivered mothers (53%) than community women (32%) had at least a primary or secondary education.

Results from both study participants revealed that some women consume alcohol during pregnancy and during various stages of pregnancy. Prenatal alcohol exposure is well known to result in physical and neurobehavioral abnormalities (Jones and Smith, 1973; Jacobson et al, 1996, Streissguth, 1994). Alcohol abuse during pregnancy can contribute to fetal problems such as brain damage (May et al., 2000; Larkby and Day, 1997; U. S. Department of Health and Human Services, 1994), low birth weight (Jacobson et al., 1996), premature delivery, poor weight gain, and malnutrition (U. S. Department of Health and Human Services, 1994; Morse and Hutchins, 2000; Lundsberg et al., 1997).

Frequency, amount, pattern or timing of alcohol consumption determines prenatal alcohol exposure and are important factors in the development of alcohol effects in the fetus (Jacobson and Jacobson, 1999). Early exposure can lead to problems in physical structure, late exposure can lead to growth deficiencies, and the central nervous system can be affected at all stages of development (U. S. Department of Health and Human Services, 2000). Women reported using alcohol in moderate amounts. Studies show that

moderate alcohol use is associated with subtle fetal alcohol effects (FAE) (Lundsberg et al., 1997) such as growth deficiency and intellectual and behavioral problems similar to those of FAS (Jacobson and Jacobson, 1999). To date there is no known safe level of alcohol intake during pregnancy (U. S. Department of Health and Human Services, 1994). Pregnant women who consume one to two drinks per day are twice as likely as nondrinkers to have low birth weight babies and are at increased risk for miscarrying during the second trimester of pregnancy (U. S. Department of Health and Human Services, 1994; Jacobson and Jacobson, 1999). In women over age 30, infants exposed to alcohol during pregnancy had decreased in birth weight, length, and head circumference (Jacobson et al., 1996). Refraining from alcohol use remains to be the best prevention of alcohol-related fetal effects.

Women mentioned important negative health effects arising from alcohol consumption during pregnancy. The presence of negative effects of alcohol intake is supported by other studies (Jacobson et al, 1996; Lundsberg et al., 1997). Only one person mentioned seeing an impaired child who was born to a woman that drank alcohol in excess. We were therefore unable determine if the women experienced these effects or knew other women with children affected by alcohol. It may also be that the information women reported was that received from their health care providers during their prenatal visits.

The types of alcoholic beverages they drink are mainly homemade brews that are important in the daily social, economic, nutritional, and cultural life of the people (Uganda Lecture, 1999). The safety of the local brews women reported drinking has been questioned. The techniques of alcohol production are poorly controlled and present

difficulty of verifying their alcoholic content (Tüsekwa et al., 2000). According to the British Broadcasting Corporation (BBC) news, 140 deaths occurred, several people were blinded, and others were hospitalized after drinking contaminated alcohol in Kenya (Kariuki wa Mureithi, 2002). Tüsekwa et al. (2000) reported that alcoholic beverages had low quality, short shelf life, and poor hygiene because the brewing technologies involved uncontrolled fermentation, unsanitary conditions, and use of rudimentary equipment for processing packaging, and storage. Beside the teratogenic risk alcohol poses to the fetus, these brews increase the risk of toxicity from the chemical from the utensils and contamination.

Managing Intoxication- Getting "Dizzy": A common expression for becoming slightly intoxicated was getting "just dizzy." Almost all participants reported that they drank to "just get dizzy" and "weak" before they stopped drinking. Participants indicated that getting drunk was uncommon and was a rare occurrence among pregnant women. It was evident from the discussions that the majority of the women felt they were in control of their drinking and getting drunk. Many mentioned levels of drunkenness they would like to reach. Falling was considered a high level of intoxication that women did not reach. There were no blood alcohol measures to estimate this level of drinking. Once they reached an acceptable level of dizziness, the women stopped drinking. Only a few described seeing women getting drunk and falling. None of the participants admitted to drinking to the point of falling. The women did not perceive being dizzy as being intoxicated.

In the present study, newly delivered mothers reported receiving advice about the effect of alcohol on the mother and her fetus from health care providers. However, few

women indicated having received advice to cut down or abstain from alcohol intake. Because pregnant women may reduce their alcohol intake following advice from health care providers, health care providers therefore hold an important role in reducing alcohol intake in pregnant women (Morse and Hutchins, 2000). We presume that either health providers are not aware that pregnant women drink alcohol; they lack the time to screen for alcohol use, or lack the training to counsel women in this area. Additionally, health care providers may not be trained adequately to screen alcohol consumption or to identify fetal alcohol effects at birth or during postnatal visits. According to the National Institute on Drug Abuse (1994) the use of alcohol by women is not diagnosed by health care providers. Morse and Hutchins (2000) indicated that health care providers neglected discussing alcohol use when providing prenatal advice. To identify the incidence of FAS in children in South Africa, experts were employed to train local physicians to identify the syndrome. This may imply training needs for health care providers for screening, counseling, and identifying children with FAS or Fetal Alcohol Effects (FAE).

A visit by the principal investigator to the prenatal care sessions revealed that women received prenatal advice in an outpatient clinic group setting from a midwife prior to completing the antenatal record. 'Education messages' were presented by a midwife while in the referral clinic for women with previous birth complications, the investigator observed a video display in the waiting room, midwives, and physicians. The messages to participants received were a list of do's and don'ts. A step-by-step description of these expectations is warranted to increase awareness of the pregnant women. Group teaching needs to encourage women participation in interactive processes. This can lead to the revelation of practices among participants or raise questions that can be used to guide

women to improve pregnancy outcomes. Women in the focus groups indicated that their main purpose of attending antenatal clinics was to obtain a card that served as insurance to receive treatment in the hospital in case pregnancy complications arose. The variations in the women's responses regarding alcohol use and its effects on the fetus indicate that either women are not receiving the messages or messages are not being delivered in an appropriate manner to the women to influence their understanding or change in behavior. It is possible that in a group session some women may miss some of the information relayed by the midwife. It should be pointed out that one-on-one interaction with health providers may build rapport that allows the woman to express herself about behaviors that are appropriate in pregnancy than when conducted in a group. Padayachee (1998) reported that health care providers in South Africa viewed women alcohol users contemptuously. Health care services were not equitably delivered to these women (Padayachee, 1998).

Reports show that prenatal care attendance is 65% in Africa compared to 97% in developed countries (United Nations Children's Fund (UNICEF), 2002). Low attendance may mean that some women do not receive the information from health care providers to bring about change in behavior. According to the Transtheoretical Model of Behavior Change, people move through a series of stages with respect to any potential behavior change, starting from a point of not thinking about making a change (precontemplation) and moving through contemplation to preparation, then action (actually working on making a change). The model also acknowledges maintenance or relapse in new behavior (Glanz et al., 1997).

Results indicated that about half of the women were not aware of the effects of alcohol and most had never heard of Fetal Alcohol Syndrome (FAS). One study conducted with natives of Northern Manitoba indicated knowledge of the effects of alcohol in women (Williams and Gloster, 1999). Younger natives were more knowledgeable about FAS and more likely to use alcohol than older natives (Williams and Gloster, 1999). No studies were found that investigated alcohol use in pregnant women in African countries.

This was the first study to show the belief that some pregnant women consume a specific alcohol, waragi, for cleaning the baby in utero. This belief, coupled with the belief by some women that it was safe to drink alcohol during pregnancy point to the potential harm faced by women and their fetuses as a result of their alcohol use. Overall there appears to be a need to sensitize pregnant women and women of childbearing age concerning the effects of drinking during pregnancy. Even if some women believed that alcohol may harm the fetus, other women continued to use alcohol during pregnancy and other believed that alcohol intake resulted in healthier babies. Prior experience with pregnancy may influence how women perceive fetal vulnerability to alcohol exposure. Women may continue to drink because of successful previous pregnancies and may not heed to health care advice. The results of the present study indicate the importance of screening for alcohol consumption during pregnancy by health care providers. The results of this study can be used most effectively in the development of intervention messages to increase women's knowledge about the effects of alcohol consumption on the fetus and to assist women avoid or reduce alcohol consumption during pregnancy.

Alcoholic beverages were consumed for different reasons. Crude waragi was drunk mainly to cleanse the fetus. Women believed that other brews increased the size of the fetus. This may be due to increase in caloric intake from the locally fermented brews using maize, millet and sorghum. One concern was that women did not associate drinking with poor fetal and maternal health outcomes or associated HIV transmission through sexual engagement or rape by male drinking colleagues.

Women's knowledge of the effects of alcohol during pregnancy may be related to maternal alcohol consumption. We did not examine if there was any correlation between mothers knowledge of fetal alcohol effects and maternal alcohol consumption. Women reported some knowledge about the effects of alcohol and receiving alcohol related advice given during prenatal care visits however; this advice may not be given often enough to bring about reduced use of alcohol.

The qualitative and descriptive data provide unique information on alcohol use among the Ganda ethnic group in a community and hospital-based samples. We speculate that the different responses in the hospital-based sample indicate some knowledge about the effects of alcohol that may be explained by their health seeking behavior and higher education level.

In summary, data show the presence of continued use of alcohol during pregnancy by some women from the Ganda ethnic group. The results of the present study may not be generalizable due to the size of the sample and lack of data on infant outcomes. Caution should be exercised in extrapolating these findings to a wider Uganda female population. The measures of alcohol consumption are self-reports, and may not be as valid as more objective measures, such as blood alcohol levels. Some under or over

reporting of alcohol use may have occurred in both groups of women. Rather than ask women what advice they received when they visited their health care, it would have been appropriate to ask women what specific advice they received on alcohol. However, results hold important public health implications for health providers. The drinking of waragi to cleanse the baby is strong belief among pregnant women that has to be counteracted. The drinking of local brews may have a protective effect on birth weight due to the carbohydrate content however; the effect of alcohol on the infant outcomes in this population is unknown. Most participants talked about how safety was not an issue. This suggests that not only do women consider they are safe but need to be made aware of the risks of drinking during pregnancy. Results indicate alcohol drinking is not heavy but need further exploration in a larger sample and in women from different ethnic and socioeconomic backgrounds. Women in the maternity wards were more aware about the effects of alcohol than women in the community.

Implications for Health Care Providers and Further Research: The results raise a number of important health-related issues among pregnant women and women of child bearing ages. Health care providers need to increase the assessment and monitoring of alcohol use in women attending antenatal care settings in order to prevent the risk of poor pregnancy outcomes. The role of the health care must include advocacy and public health education including the need for a culturally appropriate education. In this regard, health care providers must be informed and trained to assume a health educator role to inform and advise women who are at risk of poor pregnancy outcomes.

A further examination of this behavior in women is needed to explain other social aspects of drinking during pregnancy. To determine maternal risk of consumption of

alcohol an examination of the effects of economic development, socioeconomic status, increased access to alcohol, and loss of folk and traditional culture is warranted. Corroboration using observational data and alcohol vendors' participation is needed. The themes in the present study require further investigation, however, participants do provide useful information for developing health education messages for women of childbearing ages. A further examination is needed to determine the caloric and nutrient contribution of the locally fermented brews to improved birth outcomes as perceived by participants.

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Table 1. Focus Group Questions (FGQ)

DEMOGRAPHICS/OPENING (ICEBREAKER) QUESTION

As we go around the room, please give your name and briefly tell us a little about yourself.

Probe: For example, where do you live and how many children you have.

KNOWLEDGE OF THE EFFECTS OF ALCOHOL

FGQ 1. Next I am going to ask you some general questions about alcohol and pregnancy.

How much do you think it is safe for a woman to drink alcohol during pregnancy?

Probe: daily, one to two times a week, a few times a month or once a month, or it is never safe.

FGQ 2. Of the available alcoholic drinks here, which type is the safe one that a pregnant woman can have? For each type of drink mentioned Explore how much is estimated to be safe.

Probe: Malwa. tonto, waragi, whiskey, gin, beer, wine?

FGQ 3. How much alcohol do you think is safe for a woman to drink during pregnancy?

Probe: One, five, more than ten, no type of drink is safe.

FGQ 4. During what stage of pregnancy do you think it is best for a pregnant woman to drink alcohol?

Probe: Which period of time during pregnancy do you think it is safe for the mother to drink alcohol?

Probe: Early pregnancy –1-3 months. :Mid pregnancy – 4-6 months. Late pregnancy 7-9 months

FGQ 5. What are some reasons why a pregnant woman should drink alcohol?

Probe: Like to reduce pain or to prevent a miscarriage?

FGQ 6. What are some of the things that can happen to the mother or the unborn baby if a pregnant woman drank alcohol?

Probe: What can happen to the mother if she drank alcohol during pregnancy?

Probe: What can happen to the child if the mother drank alcohol during pregnancy?

FGQ 7: What else can happen to a pregnant woman or the baby?

Table 2. Selected Characteristics of Individual Interviews and Focus Group Participants

Characteristic	New Mothers of Individual Interviews Percent (n=59)	Community Women of Focus Groups Percent (n=37)
Place of residence		
Rural	17.0 (10)	--
Town/Suburb	83.0 (49)	100.0 (37)
Marital status		
Single	11.9 (7)	10.8 (4)
Married	49.2 (29)	45.9 (17)
Living with man	37.3 (22)	18.9 (7)
Separated	1.7 (1)	8.1 (3)
Widow	--	16.2 (6)
Education level		
No education	1.7 (1)	--
Primary education	45.8 (27)	54.1 (20)
Secondary school education	37.3 (22)	32.4 (12)
More than secondary school	15.3 (9)	13.5 (5)
Employed	32.0 (19)	37.8 (14)
	Mean (range)	Mean (range)
Age		
Years	23 (18-39) years	29 (20-59) years

Table 3. Alcoholic Beverages Consumed by Newly Delivered Mothers and Community Women During Pregnancy

Locally made brews consumed:
Tonto made out of banana juice and fermented with sorghum yeast.
Kwete brewed from corn and millet.
Malwa brewed from either corn flour or millet flour.
Waragi, crude gin, made using molasses and distilled.
Endiga, made out of ginger, tea leaves, and pineapples.
Manufactured alcoholic beverages:
Beer lager.
Uganda Waragi (Gin).

Table 4. Reported Frequency of Alcohol Use During Pregnancy by Newly Delivered Mothers (n=59)

Maternal alcohol characteristics	Percent (N)
Alcohol consumed before pregnancy	40.7 (24)
Alcohol consumed during early pregnancy	30.5 (18)
Alcohol consumed during late pregnancy	15.0 (9)
Safe period of gestation to drink alcohol	
Early pregnancy	13.6 (8)
Mid pregnancy	15.3 (9)
Late pregnancy	6.8 (4)
Throughout pregnancy	5.1 (3)
Do not know	59.3 (35)
Safe frequency of alcohol consumption	
Daily	3.4 (2)
1-2 times a week	25.4 (15)
Once a month	18.6 (11)
Never	49.2 (29)
Do not know	5.8 (2)
Aware of effects of alcohol on fetus	
Yes	37.3 (22)
Familiar with fetal alcohol syndrome (FAS)	
Yes	15.3 (9)

Table 5. Perceived Effects of Alcohol Consumption on the Fetus by Newly Delivered Mothers (N=59)

Fetal alcohol effect	N
Premature delivery, miscarriage or abortion	12
Brain damage	10
Poor infant health-abnormality, deformity, skin problems, lung problems, weakness, premature labor	9
Low birth weight	6
Falling leading to injury or death of infant	6
Waragi burns the baby	5
Do not know	2
Failure to deliver	1
Nothing	1
Rupture of uterus	1
Stubborn child	1

Table 6. Advice Newly Delivered Mothers Received from Health Care Providers about Alcohol Intake (N=59)

Alcohol-related prenatal advice received	Percent (N)
Alcohol can affect the fetus	71.2 (42)
Alcohol can harm mother	52.5 (31)
Cut down or avoid alcohol intake	47.5 (28)

Table 7. Newly Delivered Mothers' Beliefs about Alcohol Consumption (N=59)

Maternal beliefs about alcohol	Agreed Percent (N)	Disagreed Percent (N)	Not sure Percent (N)
Hard liquor is more harmful to the baby than beer or wine	78.0 (46)	10.2 (6)	11.9 (7)
If a pregnant woman reduces her drinking, her baby will most likely come out mentally alert	74.6 (44)	13.6 (8)	11.9 (7)
Harmful effects of alcohol intake occur at any time during pregnancy	67.8 (40)	15.3 (9)	16.9 (10)
Waragi (gin) helps to clean the baby.	61.0 (36)	13.6 (8)	25.4 (15)
It is not a smart idea to get drunk if you are planning to get pregnant	49.2 (29)	11.9 (7)	39.0 (23)
All harmful effects of alcohol on the developing fetus happen in early stages of pregnancy	32.2 (19)	27.1 (16)	40.7 (24)
If a woman drank during pregnancy and had a healthy baby it means that her next baby won't be harmed by alcohol	8.5 (5)	69.5 (41)	22.0 (13)

CHAPTER VI

BELIEFS AND PRACTICES OF GEOPHAGY AMONG PREGNANT WOMEN IN KAMPALA, UGANDA

ABSTRACT

Objective: To identify maternal beliefs, practices, and perceived benefits and harmful effects of geophagy and herbal clay.

Design: Individual interviews with new mothers.

Variables Measured: The variables measured were women's beliefs and perceptions of clay and herbs during pregnancy.

Subjects and Setting: Fifty-nine mothers from the Ganda ethnic group delivering infants in a government hospital in Kampala.

Statistical analyses performed: Descriptive statistics were used to summarize data.

Results: About half of the mothers reported craving and consuming smoked clay during pregnancy; craving was the major reason for smoked clay consumption. Almost all mothers reported consuming slurry of herbal clay, mainly for maternal and infant health. Most mothers agreed that herbal clay eased childbirth; clay consumption was a craving with no health benefits; clay reduced saliva, and eased vomiting. Most mothers disagreed that only pregnant women ate smoked clay; smoked clay was as good as food and satisfied hunger. Perceived disadvantages of consumption of smoked clay were having a

dirty baby and constipation. Perceived benefits of herbal clay were medicinal properties for softening the pelvic bones to ease childbirth and for maternal strength. Early or excessive use of herbal clay was associated with weakness in bones and painful loose pelvic joints.

Conclusions: Mothers reported nutrition-related practices that may affect maternal and infant health and some were aware of associated disadvantages of these practices.

Implications: Prenatal caregivers should screen pregnant women for geophagy and provide information about the potential harmful effects of smoked clay and herbal clay consumption.

INTRODUCTION

Motherhood is a positive and fulfilling experience for most women, however for more than 20 million women worldwide pregnancy and childbirth are associated with suffering, ill-health or death (Safe Motherhood Inter-Agency Group, 2002). Around the world a variety of traditions associated with childbirth exist. All indigenous cultures have developed knowledge of non-food substances, herbs, and foods that can be used to promote health, cure illness, and reduce discomfort. These traditional medicines hold important cultural roles and may be potential pharmaceutical agents (Mabina, et al., 1997).

Pica is the compulsive consumption of a wide variety of substances that are unusual in kind (e.g., soil) or amount (e.g., boxes of cornstarch) (Lacey, 1990; Parry-Jones and Parry-Jones, 1992). Geophagy is a type of pica characterized by the compulsive ingestion of clay and soil. Geophagy is the most widespread pica practice worldwide but is largely

unknown, underreported and/or misunderstood (Abrahams and Parsons, 1996). Geophagy occurs worldwide but is commonly practiced in tropical areas (Vermeer and Ferrell, 1985; McLoughlin, 1987; Abrahams and Parsons, 1996). In America, geophagy is more common among African Americans (Vermeer and Frate, 1979; McLoughlin, 1987). In East Africa, geophagy dates as far back as 40,000 years (Abrahams and Parsons, 1996). In Africa, geophagy is more obvious, open to discussion (Vermeer, 1966), and appears to be a cultural practice that is socially acceptable (McLoughlin, 1987). Geophagy may provide some nutritional and detoxification benefits (Abrahams and Parsons, 1996; Vermeer and Ferrell, 1985; Johns and Duquette, 1991). One study in Uganda examined the mineral content of clay and it's potential to supply nutrients to women where mineral supplements are not easily available or affordable (Abrahams, 1997). The ingestion of clay has been implicated in nutrient displacement and deficiencies of iron, zinc, and potassium (Vermeer and Ferrell, 1985; Abrahams and Parsons, 1996). However, excessive or inappropriate consumption may result in complications such as intestinal obstruction and tooth wear (Vermeer, 1966).

In many African cultures, it is common for women and children to consume clay. In women, the practice is mainly associated with pregnancy (Geissler et al., 1999; Cooksey, 1995; Hunter, 1973; Hunter, 1993; Lacey, 1990; Wiley and Katz, 1998). In Uganda, soils are mainly consumed as part of a traditional medicine prepared by traditional healers (Abrahams, 1997). Traditional medicines for healing are used by people out of their culture and ethnicity as typical treatment (Beal, 1998). These indigenous systems of healing and their contributions to modern health care are of interest to researchers. With respect to women's reproductive health care needs, many different traditional medicines

are used for conception, pregnancy, lactation, and menstrual problems (Westfall, 2001; Beal, 1998; Varga and Veale, 1997; Mabina et al., 1997). Herbal therapies may be used to induce menstruation, promote effective uterine contractions or reduce false labor pains (Westfall, 2001).

Women worldwide are the main users of herbal therapies (Beal, 1998). In African countries, it is estimated that about half the population use herbal medicines (Kasilo and Nhachi, 1992; Mbura et al., 1985; Larsen et al., 1983) and herb use is widespread in pregnancy. Herbs commonly used for pregnancy and labor have been identified in North America (Westfall, 2001; Beal, 1998; Belew, 1999; Brennan, 1999), South Africa (Varga and Veale, 1997; Mabina et al., 1997), and Tanzania (Chhabra and Mahunnah, 1994). Mabina and coworkers (1997) suggested that the ingestion of herbal clay may confer health benefits but it has also been implicated in obstetric complications. To date no clinical trials have been conducted to ascertain the therapeutic and toxic properties of these therapies.

To effectively provide comprehensive nutritional care for pregnant women during visits with health workers, information regarding women's nutrition-related practices and beliefs is needed. The aim of the present study was to describe consumption of smoked clay and herbal clay, beliefs, perceived benefits, and side effects of clay and herbal clay use among Ugandan women shortly after giving birth.

METHODS AND PROCEDURES

Study Design: The study was conducted in Kampala district, Uganda. The researchers used a descriptive design to meet study objectives. A survey of open- and closed-ended

questions was orally administered in Ganda, the local language, to a purposive sample of 70 women admitted in the Mulago hospital maternity wards after delivery and before discharge. The women gave verbal consent to participate in the interviews. The women were recruited after delivery at two labor wards at Mulago hospital in June 2001.

The researchers developed the survey exploring women's beliefs, perceptions, and consumption of clay and herbal clay based on a review of the literature. A professor and 4 students in the Department of Nutritional Sciences at Oklahoma State University verified content validity (Portney and Watkins, 2000). A pilot test of the survey instrument was conducted with 10 mothers delivering at the same hospital but not participating in the eventual study. Survey items were modified for clarity and the time taken to complete the oral interview. After pilot testing the final questionnaire included 59 questions about geophagy and demographic characteristics.

Questions referred to the smoked clay and herbal clay used during pregnancy as "bumba" and "mumbwa" respectively. The terms are derived from the Ganda dialect. The term bumba refers to a piece of smoked dried clay that is mostly broken into pieces (tablets) and chewed or sucked by pregnant women. The term mumbwa refers to a mixture of a variety of herbs with clay that is molded into a cylindrical shape with tapering ends. The herbal clay is ground into a powder, measured into a glass and mixed with water to form slurry before drinking (Abrahams, 1997). Some herbal clay is similarly eaten in tablet form like the clay.

Two interviewers, a sociologist and a nurse-midwife with experience in conducting interviews conducted the individual interviews. Training included discussing the questions and practicing asking the questions to assure consistency of procedures across

the sample of women interviewed. The Oklahoma State University Institutional Review Board, the Uganda National Council of Science and Technology, Mulago Hospital Administration, and Department of Gynecology units reviewed and approved study methods.

Subjects' selection criteria included mothers from the Ganda ethnic group aged 18-39 years who gave birth to a live infant at full gestational age less than one week before the interview. Data were collected from women delivering at Mulago Hospital during two weeks in June 2001. Data were collected daily between 9.00 a.m. and 3.00 p.m. The hospital stay was usually 24 hours for vaginal delivery and about one week for caesarean birth. Interviews were conducted within 24 hours for normal delivery, by the bedside of women. Interviews with women who delivered by caesarean section were conducted within one week of delivery of the infants. Birth weights were recorded from the hospital identification band that was placed on the wrist of the newly delivered baby.

SPSS 11.0 for Windows (2002) was used for analysis. Frequencies and means were used to describe data. Content analysis was used to analyze qualitative responses of newly delivered mothers. Responses with similar phrases or text were identified and placed together. A frequency count was conducted.

RESULTS

Response Rates: Individual interviews were conducted with 70 mothers who had an infant less than one week old. One mother did not complete the interview due to ill health and 10 mothers were of different tribal origins and their responses were eliminated from

the study. A total of 59 mothers from the Ganda ethnic group were included in the present study.

Demographic Data: A summary of demographic characteristics of the mothers is in Table 1. Most mothers resided in towns or suburbs of Kampala. About half of the mothers were married and most were unemployed. Most mothers had either a primary or secondary school education. There were more multiparous than primiparous mothers. Infants born at the time of the present study had an average birth weight of 3.28±0.5 kg with a range of 1.8 to 4.7 kg. The average age of mothers was 23 years with a range of 18 to 39 years. Most mothers (77%) reported having adequate nutrition during pregnancy.

Maternal Clay and Herbal Clay Consumption: Table 2 indicates that about half of the mothers craved and ate smoked clay ("bumba") during pregnancy. Consumption of smoked clay occurred primarily during the last two trimesters of pregnancy. The amount of smoked clay eaten ranged from 25 to 100 gm per day. Of the 31 women who reported consuming smoked clay, 12 consumed it daily.

About half of the mothers craved herbal clay ("mumbwa") and a large majority consumed herbal clay as a solid or slurry during pregnancy. Most mothers used the herbal clay mixture daily during the second and third trimester. Most mothers (n=52) knew the method used by herbalists to prepare herbal clay. Herbalists mixed a variety of plants with clay and molded it into a cylindrical shape measuring about 1 inch in diameter and 5 inches long. However, the women did not report which herbs were used in the slurry. A total of 55% (n=29) of the women used both bumba and mumbwa during pregnancy.

Health Benefits and Adverse Effects of Smoked Clay and Herbal Clay Use: When asked in an open-ended question, 27 mothers said they did not know the benefits of smoked clay (bumba); and 20 indicated that smoked clay had no benefits. Perceived maternal benefits of consuming smoked clay were increased appetite (n=3); reduced vomiting (n=3), nausea (n=2), and saliva (n=2); and a feeling of satisfaction or enjoyment (n=2). Twenty-three mothers did not know the problems associated with eating smoked clay; four indicated there were no problems associated with smoked clay consumption. Perceived harmful effects of smoked clay were constipation (n=12) and worm infestation (n=3).

Twenty mothers indicated that herbal clay (mumbwa) was not associated with any adverse health problems; 15 mothers did not know if there were any problems associated with herbal clay consumption. Mothers reported that excessive, early use or improper preparation of the herbal clay was associated with the problems such as delivering a baby with dirt (perhaps vernix or meconium) (n=20), weak and painful loose pelvic joints (n=6), ruptured uterus (n=6), and premature labor (n=3). Perceived maternal benefits of herbal clay were its medicinal properties that enhance quick and easy childbirth (n=24), soften the pelvic bones (n=18), and provide strength/energy (n=10). Prevention and treatment of illnesses (n=15) such as syphilis (n=14), maintenance of general good health (n=11), and ward off evil spirits (n=4) were other reported herbal clay benefits. Perceived fetal benefits of herbal clay were prevention of skin infection or "noga" (n=4) and correcting fetal position in the womb (n=2).

Maternal Beliefs about Clay and Herbal Clay Consumption: Table 3 shows mothers' responses to beliefs statements. Most mothers agreed that only pregnant women ate smoked clay; consumption of smoked clay was a craving with no benefits; herbal clay and smoked clay eased childbirth; smoked clay reduced saliva and eased vomiting; consumption of smoked clay was an avoidable urge; smoked clay caused worm infestation; and consumption of smoked clay should be prevented during pregnancy. Most mothers disagreed with statements that smoked clay was as good as food, satisfied hunger, and provided health benefits; craving clay was caused by nutrient deficiency or dietary mineral deficiency; and provided a feeling of well being.

DISCUSSION

Maternal Clay Consumption: Results of the postnatal survey showed that most women of the Ganda ethnic group used clay during pregnancy. The clay (bumba) consumed was dried smoked clay. Different varieties of clay are usually sold in the market or street by vendors (Abrahams, 1997). Five main sources of soil consumed by women in other studies included soil from river banks, walls of kitchens, termite mounds, termite soil construction on trees (Vermeer and Ferrell, 1985, Geissler et al., 1999) and soft stones from riverbeds (Geissler et al., 1999). The kinds of soils consumed had certain qualities of color, taste, texture (softness and plasticity), odor or flavor, and ability to dissolve (Vermeer and Frate, 1979; Geissler et al., 1999).

About half of the women in this study reported consuming smoked clay during pregnancy. Prevalence of geophagy was estimated to be 45% to 90% among pregnant African women and 28% in the same population in North America (Lacey, 1990). On the

Kenyan coast, 73% of the women between 5 to 9 months of pregnancy were geophagous (Geissler et al., 1999). Wiley and Katz (1998) reported clay consumption in 38 of 45 pregnant women who were non-cattle keepers but only 5 out of 15 cattle keepers. In Mexico, 21% of 33 pregnant women with pica consumed soil (Simpson, 2000). In rural Mississippi, 57% of 142 pregnant women were geophagous (Vermeer and Frate, 1979).

Most women in the present study ingested smoked clay during the second and third trimesters. Wiley and Katz (1998) reported that women may ingest soil during the first, second, or third trimester, or throughout pregnancy. In Sudan, geophagy was confined to the first trimester (Anell and Lagercratz, 1958). Other studies showed that women ingested soil towards the end of the second trimester (Geissler et al., 1999; Wiley and Katz, 1998) with increased prevalence of geophagy with higher gestational age (Geissler et al., 1998B). The Tiv of Nigeria ingested clay throughout pregnancy (Vermeer, 1966).

The etiology of pica in humans is complex involving environmental, nutritional, socioeconomic, physiologic, cultural, and psychiatric causes. Among pregnant women, geophagy has been described as a craving (Lacey, 1990; Hunter, 1973; Hunter, 1993; Cooksey, 1995). Women in this study believed that smoked clay consumption was just a craving with no health benefits and that consuming smoked clay was an unavoidable urge. "Addiction or irresistible" were terms used to describe the craving in the study of low-income women in Mexico (Simpson, 2000, pg 22).

Craving of substances may be related to the sense of smell. According to Cooksey (1995), the craving and resultant smelling of selected substances (olfactory craving) increased during pregnancy. Reports similar to the present study findings about the olfactory craving that led to clay ingestion were the smell of smoked clay (Vermeer and

Frate, 1979). This form of craving was described as "the smell of soil is good after a few rain drops" and "this smell increases our desire to eat the soil" (in the present study, chapter IV p 66). Psychological or emotional reasons for consuming smoked clay were described as providing a feeling of well-being and pleasure or enjoyment. The physiological reasons women reported for clay consumption were reduced saliva, nausea, and vomiting. Attraction for eating soil was described as its rich texture or the feel of soil in the mouth, women liked the taste of clay (smoke, salty, sweet), pregnancy made women eat clay, clay helped reduce nausea and saliva (Geissler et al., 1999), and women yearned for soil (Simpson, 2000; Geissler et al., 1999; Cooksey, 1995).

This study reiterated the women's beliefs that smoked clay is not a substitute for food, and cannot satisfy hunger. In other studies, the urge to eat soil was equated to thirst but not hunger (Geissler et al., 1999; Vermeer and Frate, 1979) and soil consumption was not considered to be a substitute to meals (Vermeer and Frate, 1979).

The present study did not indicate nutritional benefits of smoked clay except that of relieving nausea. Some studies suggest clay has medicinal and nutritional benefits (Wiley and Katz, 1998; Abrahams, 1997; Vermeer and Ferrell, 1985). Kaolin-based pharmaceuticals (i.e. Kaopectate) are commonly used in human populations to treat diarrhea and intestinal upsets (Vermeer and Ferrell, 1985). Wiley and Katz (1998) proposed that clay conferred the following benefits: first trimester, the clay bound dietary toxins to protect the fetus and ease nausea, and second trimester, clay served as a nutrient supplement.

Abrahams (1997) reported the potential benefit of clay in supplying bioavailable minerals to consumers. Estimated bioavailability of iron from Uganda soils after

extraction with 0.1m HCl ranged from 3% to 42% of the Recommended Nutrient Intakes (UK) for iron for males (Abrahams, 1997). The acidic conditions of the stomach were suggested to enhance mineral availability and the ability of clay to exchange with other cations of similar charges while the reverse was postulated for the more basic conditions of the small intestines. It was concluded that the net effect of clay would depend on the nutrients, type of food, and location in the gastrointestinal tract (Wiley and Katz, 1998).

The potential harmful effects of pica vary by the type of substance eaten (Lacey, 1990). In the present study, mothers believed that excessive smoked clay consumption was associated with constipation and few mothers agreed with the statement that smoked clay alone provides health benefits. Reported problems from geophagy include perforation of the gut, peritonitis, obstruction, lead intoxication, and infestation with parasites (McLoughlin, 1987). Severe abdominal pains caused by a bolus of clay in the descending colon were reported in a pregnant woman who ingested clay (Gudson and Tunca, 1974). Symptoms of weakness, pain, nausea, vomiting, fever, seizures, and constipation were the cause of the only documented death from complications of clay in a pregnant woman ingesting 200 g to 300 g of clay daily (Key et al., 1981).

Although most women in the present study believed that smoked clay could cause worm infestation, they were not clear in their beliefs about the relationship between smoked clay and worm infestation. About half of the women believed that worms caused the ingestion of smoked clay and a similar number believed that smoked clay consumption caused worms. Parasitic infection has been associated with geophagy (Geissler et al., 1998A). However, two studies found no differences in hookworm or roundworm prevalence between geophagous and non-geophagous women in Kenya

(Geissler et al., 1998A) and children in rural Mississippi (Vermeer and Frate, 1979). Hookworm infection was not related to geophagia in other studies (Gelfand, 1945; Vermeer and Frate, 1979). Three possible explanations for this lack of association are: the clay that is ingested is mainly dug from several feet below the ground where the risk of contamination with hookworm eggs is reduced, drying and baking of the clay kills the eggs (Vermeer and Frate, 1979), and direct contact with skin is the most common route of entry of hookworms.

A few women in the present study agreed that craving smoked clay was caused by a mineral deficiency. Studies also show that geophagy is associated with iron deficiency (McLoughlin, 1987; Edwards et al., 1964; O'Rourke et al., 1967; Talkington et al., 1970), zinc deficiency (Danford and Huber, 1982), and low calcium intake (Wiley and Katz, 1998). Iron deficiency is three times more common in geophagus than non-geophagus people (Bothwell, 1972). In South Africa, 10 of 53 anemic women ingested soil (Mokhobo, 1986). Wiley and Katz (1998) found a lower prevalence of clay consumption among African women who owned dairy cattle compared to the group with no cattle. Lower plasma iron, zinc, copper, hemoglobin levels, and hematocrit were observed in mentally handicapped patients who practiced pica compared to non-pica patients ingesting similar dietary and trace mineral intakes (Danford and Huber, 1982). This suggests that non-food substances that were consumed prevented the absorption of minerals.

It is not known if smoked clay consumption causes nutrient deficiency, or is a consequence of the deficiency (Horner et al., 1991). In animals, there is evidence that deficiency is associated with food preferences (Simpson, 2000; Wiley and Katz, 1998).

The association of clay with impaired nutrient intake is postulated to occur by the exchange of ions in the clay with similar charges in the diet (Bothwell, 1972; Mokhobo, 1986; McLoughlin, 1987; Wiley and Katz, 1998), or by chelation or binding of iron in the intestines, which reduces bioavailability. If iron deficiency is the cause of the pica behavior, then iron therapy should end the pica behavior. Some studies showed that the ingestion of pica was associated with deficiencies of iron and zinc that were cured shortly after mineral therapy (Mokhobo, 1986; Daoud, 1974; Johnson, 1982).

Some women in the present study supported the need for prevention of geophagy during pregnancy. This recommendation was not reported in previous studies. Previous studies reported that women craved clay but refrained from eating it because the clay was dirty and would harm the fetus (Simpson, 2000).

Consumption of Herbal Clay: Results of this study also showed that the majority of the mothers consumed herbal clay. Consumption of the herbal clay over the course of pregnancy was thought to confer maternal and fetal health benefits. In South Africa, Mabina and coworkers (1997) found 55% of the women reported ingestion of herbs compared to 90% in the present study (Mabina et al., 1997). Traditional healers in Uganda usually prescribe herbal medicine and sell it with instructions and a list of its healing powers (Abrahams, 1997). In North America, Westfall (2001) described a number of herbs used in pregnancy labor and delivery.

In the present study, most women used the mixture of herbs and clay to promote a favorable course of pregnancy and facilitate quick and easy labor and childbirth. This finding is similar to previous studies indicating wide use of herbal medicines in Africa to maintain and reduce the need for medical intervention during pregnancy (Mbura et al.,

1985; Chhabra and Mahunnah, 1994; McCormack, 1982; Gelfand, 1945; Mutambirwa, 1985; Wiley and Katz, 1998). Women in the present study used herbal clay mainly during the last trimester and at the time of labor to facilitate delivery. Women also mentioned the use of herbs to correct positioning of the fetus, to prevent and treat various illnesses including syphilis. Brennan (1999), reported similar homeopathic properties of herbs in North America.

In the present study use of herbal clay to ward off evil spirits was mentioned by a few women and needs further exploration. According to Gelfand (1945), African peoples believed soil had magical powers. Reports of use of herbs to fight spirits have been reported in Kenya (Geissler et al., 1998B), Tanzania (Mbura et al., 1985), and South Africa (Varga and Veale, 1997).

The most common disadvantages of herbal clay use reported by the mothers were premature labor, meconium passage, painful loose joints, and ruptured uterus. Some studies have suggested an association between the use of herbs and complications of childbirth (Mabina et al., 1997; Mitri et al., 1987). Mabina et al. (1997) determined the effect of herbal medicine on pregnancy outcome of 229 women in labor. There was a higher incidence of meconium stained amniotic fluid and fetal distress in women who used herbs than non-herb users. Mitri et al. (1987) found meconium staining in 36% (174 of 478) women in labor ingesting herbs. Few of the herbs women take have been clinically tested or analyzed for safety and efficacy or for their nutritional, pharmacologic or phytochemical benefits (Westfall, 2001).

In the present study, women readily reported consuming smoked and herbal clay and responded to questions about smoked clay and herbal clay. Two other studies in Africa

reported this positive response among study participants (Geissler et al., 1999; Vermeer and Frate, 1979). However, some studies in Europe, Mexico and North America reported discomfort in disclosure of pica habits (Hunter, 1973).

CONCLUSIONS

In summary, the present study indicates that pregnant Ganda women consume smoked clay and herbal clay. Few women believed that smoked clay intake satisfies hunger, eases childbirth, or substitutes for food, however, herbal clay was taken to ease childbirth. Results of the present study indicate that geophagy is related to the environmental, cultural, and psychological needs of the women. Among the Ganda, geophagy seems to be a common custom rooted in the cultural traditions and attitudes of this ethnic group.

The study reveals the prevalence of geophagy in Ganda women in Uganda, the specific type of pica, amounts ingested and frequency of habit, and periods of vulnerability. Women openly reported why, when, and how they consumed clay. Women were specific about their beliefs about clay consumption. But women were not certain as to the harmful effects that may occur with the consumption of smoked clay and herbal clay.

It is clear from the responses to open-ended questions that the smoked clay and herbal clay were eaten for different and specific reasons. Smoked dried clay, bumba, was used to alleviate a craving while the herbal clay, mumbwa, was used as a drug to facilitate childbirth and treat illnesses. The benefits of smoked clay consumption were mainly maternal but herbal clay consumption was associated with both maternal and fetal benefits. Some mothers believed that constipation was related to smoked clay intake and

herbal clay consumption may be related to delivery of a dirty baby. About half of the women reported consuming clay because of a craving. The women did not believe that smoked clay was a substitute for food or satisfied hunger. In the present study, clay was not consumed to alleviate hunger or for the potential nutrients it may provide. However the finding that herbal clay is used for health reasons provides a starting point to examine the potential benefits of herbs. Ascertaining the safety and effectiveness of herbs may offer a cheap alternative to modern medicine. The traditional herbalists and medical doctors need to work together so as to improve pregnancy outcomes.

The implications of this study are limited since those interviewed did not represent all ethnic groups in Uganda with diverse lifestyles, customs and traditions. A small sample size is also a limitation because it is not representative of all newly delivered mothers in the Ganda ethnic tribe. Responses from a convenience sample interviewed in a government hospital may be different from newly delivered mothers who had their babies at home; as a result of health-seeking behavior. The hospitalized mothers may have been more health conscious and may have provided answers that they perceived to be more acceptable to the professional interviewers than mothers who delivered at home. This study relied on participant recall that may bias the accuracy of information. We examined geophagy only during pregnancy, not before pregnancy or postpartum.

Implications for Healthcare Providers and Future Research: People may change their behavior when they have knowledge about the relationship between their behavior and health, and when the motivation exists to embark on changing the behavior. Health education programs or education strategies are needed to educate girls and women of childbearing age about the possible maternal and fetal harmful effects of excessive

ingestion of smoked clay and herbal clay. Few women indicated some negative effects of smoked clay and herbal clay consumption; therefore women may be receptive to education about potential risks of geophagy.

The women were not clear as to whether smoked clay is a consequence of nutrient or mineral deficiency. Among researchers, the causal effects of nutrient deficiency and pica are inconclusive. Further controlled studies are needed to clear this dilemma of whether pica causes or is a result of nutrient deficiency.

Almost all women ate herbal clay and most thought it helped childbirth. The herbal remedies revealed treatment for women's problems but there is need for formal scientific study to identify all the herbs and to evaluate the treatments women use. Education is needed regarding the possible danger of herbal clay intake to the fetus and the mother. Considering the firm beliefs about the smoked clay and herbal clay, support groups may be necessary with women who had a normal delivery with healthy babies without the use of herbal clay. Prevention of these practices among pregnant women needs further exploration with the women as major participants to resolve the widespread use. Lastly, there is need to obtain further information on the herbs used in the clay with herbalists.

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Table 1. Maternal Sociodemographic Characteristics (N=59)

Characteristic	Percent (N)
Place of residence	
Rural	17.0 (10)
Town/Suburb	83.0 (49)
Marital status	
Single	11.9 (7)
Married	49.2 (29)
Living with man	37.3 (22)
Separated	1.7 (1)
Employed	32.0 (19)
Education level	
No education	1.7 (1)
Primary education	45.8 (27)
Secondary school education	37.3 (22)
More than secondary school	15.3 (9)
Parity history	
First time mothers	25.4 (15)
1 child	18.6 (11)
2 children	13.6 (8)
3 children	30.5 (18)
4+ children	11.9 (7)

Table 2. Maternal Reported Clay and Herbal Clay Use During Pregnancy

Clay and herbal use by women	Clay % (N)	Herbal clay % (N)
Maternal craving of clay and herbal clay	52.5 (31)	50.8 (30)
Maternal consumption of clay and herbal clay	52.5 (31)	89.8 (53)
Pregnancy stage when clay and herbal clay were consumed[1]		
1-3 mo.	11.9 (7)	11.9 (7)
4-6 mo.	23.8 (14)	52.6 (31)
7-9 mo.	27.1 (16)	45.8 (27)
Frequency of use clay and herbal clay		
Daily	38.7 (12)	54.7 (29)
Sometimes	61.3 (19)	45.3 (24)
Times for ingestion of clay and herbal clay		
Mealtimes	--	3.8 (2)
Before mealtimes	10.0 (3)	22.6 (12)
After mealtimes	20.0 (6)	17.0 (9)
Anytime	70.0 (21)	56.6 (3)
Reasons for use of clay and herbal clay use		
Craving	41.0 (24)	7.5 (4)
Tradition	--	7.5 (4)
Health	--	84.9 (45)

[1]The values do not add to 100% because of combined multiple responses
Total newly delivered mothers interviewed, n=59

Table 3. Mothers' Responses to Belief Statements about the Eating of Clay During Pregnancy (N=59)

Belief statement	Agree % (N)	Disagree % (N)	Not Sure % (N)
Clay consumption is just a craving with no benefits	83.1 (49)	10.2 (6)	6.8 (4)
Taking herbal clay makes delivery easier	79.7 (47)	16.9 (10)	3.4 (2)
Clay reduces excessive saliva in the mouth	72.9 (43)	11.9 (7)	15.3 (9)
Clay helps reduce the feeling of vomiting	59.3 (35)	22.0 (13)	18.6 (11)
Eating clay is an unavoidable urge in pregnancy	57.6 (34)	39.0 (23)	3.4 (2)
Clay can cause worm infestation	55.9 (33)	18.6 (11)	25.4 (15)
Prevent clay consumption during pregnancy	52.5 (31)	40.7 (24)	6.8 (4)
Clay provides a feeling of well being	45.8 (27)	35.6 (21)	18.6 (11)
Clay improves the taste of food	28.9 (17)	47.5 (28)	23.7 (14)
Worms cause women to crave clay	23.7 (14)	44.1 (26)	32.2 (19)
Craving clay is caused by nutrient deficiency	22.0 (13)	59.3 (35)	18.6 (11)
Craving clay is caused by mineral deficiency	13.6 (8)	55.9 (33)	30.5 (18)
Eating clay makes delivery easier	8.5 (5)	69.5 (41)	22.0 (13)
Clay consumption provides health benefits	5.1 (3)	69.5 (41)	23.7 (14)
Clay satisfies hunger	6.8 (4)	83.1 (49)	10.2 (6)
Clay is as good as any other food	1.7 (1)	88.1 (52)	10.2 (6)
Only pregnant women eat clay	--	98.3 (58)	1.7 (1)

CHAPTER VII

HEALTH CARE PROVIDERS' CONCERNS ABOUT THE HEALTH OF WOMEN IN KAMPALA, UGANDA

ABSTRACT

Uganda experiences high maternal mortality (506 maternal deaths per 100,000 live births). We explored the factors that healthcare providers thought affect the health of pregnant women. A survey was conducted with 21 obstetricians and 32 registered nurse-midwives. Providers perceived nutrition-related problems of pregnant women to be poverty, poor pregnancy nutrition, low weight gain, low education levels, poor health, and large families. Perceived hindrances to healthcare delivery were patient overload; limited time per patient; inadequate medical staff, facilities, materials, supplies and drugs; language barriers; maternal cultural beliefs; late prenatal visits; and non-continuity of healthcare provider with patient. Reported effects of alcohol consumption were maternal-fetal effects, physical injury, and low prenatal care attendance. One provider listed the need to avoid alcohol consumption. Healthcare providers' perceived maternal alcohol beliefs were emotional well-being, quick and easy delivery, pain relief, increased infant size, and socialization. Also reported was mothers' lack of knowledge about the specific harmful effects of alcohol. Study findings provide evidence for the need to examine

maternal issues that affect successful pregnancy outcome as a result of maternal environment and the development of appropriate intervention messages.

INTRODUCTION

About 15% of women worldwide develop potentially life-threatening complications during pregnancy, childbirth, or the immediate postpartum period (World Health Organization (WHO), 1994). Every year 585,000 women die from complications of pregnancy and childbirth. Maternal deaths due to pregnancy or childbirth related illness and injuries in developing countries account for 25%-33% of all deaths (WHO, 1998A). Five main causes of obstetric deaths, accounting for nearly 80% of maternal deaths, can be prevented through actions that are effective and affordable in developing countries, such as good maternal nutrition and high quality maternal health services (WHO, 2002).

In Uganda, an estimated 506 maternal deaths occurred per 100,000 live births in 1995 (United States Agency for International Development, 2002; CIA World Fact Book: Uganda, 2002). Factors contributing to poor pregnancy outcomes were limited education, low economic status of women, lack of access to and control of resources, and lack of power in decision-making (Safe Motherhood Inter-Agency Group, 2002). Sixty-five percent of neonatal deaths are due to preventable pregnancy related causes such as neonatal tetanus, maternal iodine deficiency, and low birth weight. Reducing maternal and perinatal mortality and morbidity requires addressing women's health during pregnancy, childbirth, and for several weeks postpartum, as well as care of the newborn (Safe Motherhood Inter-Agency Group, 2002A).

The national health policy in Uganda incorporates the Safe Motherhood Initiative with the goal of reducing maternal mortality by 30% over the next 5 years (Safe Motherhood Inter-Agency Group, 2002B). Included in the initiative are improvements in antenatal, obstetric, and postpartum care. The Safe Motherhood Initiative deals with recognizing pregnancy complications, and ensuring that a woman receives professional help during and immediately after childbirth.

The objectives of the present study were to determine the perceptions of two key provider groups (nurse-midwives and obstetricians) regarding nutrition and health-related concerns among pregnant women, and hindrances to effective prenatal care. Information gathered from the present study will be useful for health care providers to include in their health education for pregnant women. The information will be used to assess risky pregnancy behaviors and to be provided as advice to pregnant women so as to improve pregnancy outcomes.

METHODS AND PROCEDURES

Population Sample: The study was conducted in a large metropolitan government owned hospital in Kampala district, central Uganda. To address study objectives, a purposive sample of nurse-midwives (32) and obstetricians (35) working directly with pregnant women and newly delivered mothers was contacted during June 2001. Announcements of the upcoming study were made at Gynecology Department meetings to solicit obstetricians' and nurse-midwives' participation in the study. Oklahoma State University Institutional Review Board, The Uganda National Council of Science and

Technology, and Mulago Hospital Administration and Department of Gynecology reviewed and approved all study methods.

Instrument and Data Collection Methods: A structured open-ended questionnaire was developed by the principal investigator to elicit answers based on the study objectives. The questionnaire was used to collect data examining the perceptions of health providers' nutrition and health related concerns among pregnant women. One pilot test of the survey instrument was conducted with 3 nutrition education students and 5 healthcare workers not included in the study. Two professors in the Department of Nutritional Sciences at the Oklahoma State University verified the content validity. Few adjustments were made to the questions.

Questionnaires were distributed with a return self-addressed envelope. Reminder announcements were made at the meeting and a second questionnaire was distributed to non-respondents two weeks after the initial distribution.

The open-ended questions were: list problems related to nutrition that you believe would benefit pregnant women; describe problems that hinder your ability to work with expectant mothers; indicate your greatest concern for pregnant women in Uganda. Participants were also asked if they believed that there were benefits to a pregnant woman consuming alcohol and if they thought that pregnant women believed that alcohol consumption had benefits.

Healthcare providers' responses were content analyzed and code words were created that captured the meaning of the text segments. If the text segment written by the respondent could be coded with multiple code words, each text segment was written on a

separate sheet with the appropriate code word. The sheets were sorted and grouped based on similarity of code words.

RESULTS

Subjects: Out of 67 questionnaires distributed to health care providers working directly with pregnant women and newly delivered mothers, 32 nurse-midwives and 21 obstetricians completed the self-administered survey. Overall health providers' response rate was 79% (n=53). The response rate for nurse-midwives was 100% and for obstetricians, was 60%.

Nutrition and Health-Related Concerns of Pregnant Women Perceived by Health Providers: Summaries of the nutrition and health-related concerns of pregnant women listed by health care providers are in Table 1. The healthcare providers identified concerns about maternal poverty due to unemployment and lack of farmland, poor maternal diets, lack of knowledge related to health and nutrition, poor maternal health, large family sizes, poor hygiene, and ingrained cultural traditions such as the ingestion of clay and herbs.

Health care providers also listed their greatest concerns for pregnant women (Table 2) such as low attendance at prenatal care clinics, low maternal education levels and health (sex) education, risky maternal behaviors, and high maternal morbidity and mortality. Institutional concerns listed by healthcare providers included inadequate facilities and poor remuneration.

Table 3 lists the issues that healthcare providers reported hindered their ability to work effectively with pregnant women. Healthcare providers listed issues including high

patient load, limited patient counseling time, inadequate medical staff, facilities, and transportation, and maternal ignorance, illiteracy, language barriers, and cultural traditions. As stated by one provider, "most antenatal mothers just come and lie on the couch without saying a word including not saying their complaints."

Healthcare providers indicated their beliefs regarding the benefits of consuming alcohol during pregnancy. Most indicated there were no benefits but there were harmful effects of alcohol such as adverse maternal and fetal alcohol effects, low birth weight, risk of physical injury, and failure to attend antenatal care (Table 4). Eight providers listed benefits such as increased appetite, emotional well-being, and enhanced socialization.

Healthcare providers were also asked to give their impressions of maternal beliefs about alcohol use in pregnancy (Table 5). While obstetricians mentioned that women knew that alcohol consumption had no benefits, half of the nurse-midwives indicated that women believed alcohol cleansed the baby's skin. Other views health care providers listed regarding women's beliefs of alcohol benefits were emotional satisfaction, quick and easy childbirth, increased infant size, socialization, pain relief, nutritional benefit, and a prestige as stated by one provider, "to afford alcohol is seen as a sign of prestige." However, providers pointed out that "those pregnant women that take alcohol do it because they are addicted and not due to benefits" and another provider indicated that "most women do know that alcohol is not good in pregnancy. What they don't know is why" and "many women avoid alcohol during pregnancy because they think alcohol harms the baby, although they do not know how."

DISCUSSION

Major nutrition-related concerns for pregnant women listed by health care providers in the present study were the concerns of maternal poverty related to lack of farmland and unemployment, lack of education, large family sizes, and ingrained cultural traditions. Health providers indicated several factors that influenced the outcome of a pregnancy including income and education. Reports showed that poverty and low education levels were factors that contributed to poor pregnancy outcomes in women in Uganda (Ministry of Health-Uganda, 1999). According to the Safe Motherhood Inter-Agency Group (2002), poverty and lack of education reduce a woman's ability to make informed decisions and the ability to seek and receive maternal healthcare. Factors that contribute to poverty in Uganda include high rates of unemployment (Uganda Ministry and Finance and Economic Planning, 1991) and a low Gross National Product (Canadian International Development, 2002; Safe Motherhood Inter-Agency Group, 2002).

Poor maternal health such as malaria, anemia, and HIV infection were listed as a concern among health care providers in the present study. The Uganda Ministry of Health (1999) indicated that maternal morbidity was a major health problem contributing as many as 1,200 deaths per 100,000 live births. Factors contributing to maternal morbidity and mortality were malaria and HIV infections (Ministry of Health-Uganda, 1999). Malnutrition including deficiencies of iron, vitamin A, and iodine were reported as major public health problems (Ministry of Health-Uganda, 1999, Uganda National Food and Nutrition Council, 1996).

In the present study, health care providers indicated poor diet of pregnant women as a concern. An adequate diet during pregnancy leads to successful pregnancy outcomes

(Institute of Medicine, 1990; Worthington-Roberts and Williams, 1997). Adequate diet would be one that provides sufficient energy and enough of all the nutrients to meet the increased needs of pregnancy (Institute of Medicine, 1990). Because a healthy pregnancy depends on a sufficient weight gain, pregnant women need these nutrients to cover the growth and development of the placenta, uterus, fetus, blood, and breasts (Institute of Medicine, 1990; Worthington-Roberts and Williams, 1997).

Low and late antenatal care attendance was another concern that was indicated by health care providers in the present study. Bloom et al. (1999) found more frequent use of prenatal care led to better maternal care and safer delivery. Amooti-Kaguna and Nuwaha (2000) found a woman's choice of location of delivery (home, clinic with traditional birth attendant or private clinic) was related to access to maternity services; influence from spouse and other relatives; perception of traditional birth attendants or healthcare workers; self-efficacy; previous experience with child birth; and awareness of pregnancy complications. Mothers who were told that their pregnancy was normal during the prenatal care visits tended to discontinue their health visits (Amooti-Kaguna and Nuwaha, 2000). Factors that influenced prenatal care attendance among pregnant women in Vietnam were amount of education, number of children, and urban residence (Swenson et al., 1993). Having more than five children, illiteracy, and non-utilization of prenatal care services were associated with an increased risk of maternal death in Nigeria (Ujah et al., 1999).

Large families and poor hygiene were other issues that health care providers raised in the present study. Large families demand time and energy and may contribute to low antenatal care attendance. Lack of childcare and limited resources to meet pregnant

women's nutritional and medical care needs may contribute to low prenatal care attendance (Weeks, 1977). Poor hygiene is a risk factor for the spread of water and food borne diseases that increase morbidity in and therefore poor reproductive health (Lonergan and Vinsickle, 1991; Mukungu, 2000).

Hindrances to effective health care delivery reported by health care providers in the present study, included a high ratio of patients to health providers. The high patient load resulted in limited time for health care providers to adequately cover all components of prenatal care in one-on-one or group discussions with women. High numbers of patients to the physician may lead to exhaustion of physicians, long waiting times for patients, and poor or inadequate delivery of quality health services. Long waiting times may discourage pregnant women to make frequent prenatal care visits. Additionally, inadequate delivery of services by overworked physicians may lead to the distrust in health care by pregnant women. These two factors combined may promote the use of traditional or native treatments as more effective than long waiting lines and a brief meeting with the physician.

Health care providers in the present study cited communication barriers as hindrance to effective prenatal care. Specifically listed were language barriers, lack of education or ignorance by the woman, and inability of women to state their problems during the prenatal visits. As stated by one provider, "most antenatal mothers just come and lie on the couch without saying a word including not saying their complaints." We can only speculate that there is a possibility that women are not free with health care providers. The high numbers of women per providers may rush the delivery of health services which may not give ample time for the woman to express her concerns; secondly women may

be afraid of health care providers due to the education gap or due to the way they are received by the providers in the healthcare setting; again women may believe that health care providers know everything related to health and lie down to wait for information from the provider; or it may language problem of women. Kabakian-Khasholian et al. (2000) described women's experiences of prenatal care in Lebanon. Findings indicated that women trusted their physicians totally, rarely questioned the usefulness of many routinely applied procedures, and found technical aspects intimidating.

In the present study, health care providers' beliefs regarding the benefits of maternal alcohol consumption varied. Most indicated that there were no benefits except those associated with "peace of mind, and resting well." Harmful effects mentioned by a few health care providers included maternal and infant alcohol effects, low birth weight infant, physical injuries of the mother and infant, nutritional problems of the mother, and low antenatal care attendance. The effects of alcohol on the developing fetus have been well documented such as growth deficiency (delayed physical growth and development), a characteristic set of minor facial traits, mental and behavioral deficits (Jones and Smith, 1973; Jacobson and Jacobson, 1999; Jacobson et al, 1996). Birth outcomes of mothers that consumed alcohol were premature delivery, growth deficiency, and respiratory distress (Jones and Smith, 1973). Potential long-term effects on the social and development abilities of the child included demonstrate difficulties with learning, memory, attention, problem solving, and mental and social interaction (Hankins, 2002; Jones and Smith, 1973; Jacobson and Jacobson, 1999; Jacobson et al., 1996).

In the present study, perceptions of health care providers' pertaining to maternal beliefs about alcohol consumption included alcohol cleaned the baby's skin, emotional

well-being, and quick and easy childbirth. Women reported that delivering a baby with dirt such as mucous, resulted in mistreatment by nurse-midwives. Women claimed that nurse-midwives shouted, slapped, or neglected them. By drinking waragi, women found that the baby came out cleaner. Zambrana and Scrimshaw (1997) examined the effects of psychosocial factors that were associated with alcohol use in low-income women of Mexican and African America origin. Women who used alcohol were more likely to be single, have an unplanned pregnancy, make late prenatal care visits, and have medical risk (Zambrana and Scrimshaw, 1997).

The results of the present study may not be generalizable due to the size of the sample and the fact that data were collected in only one hospital affiliated with the government and university. The validity of self-report by health care providers of concerns in pregnant women may not accurately reflect their concerns and may affect study findings. Social desirability may have played a role in the responses of the health care providers. Health care providers may have reported concerns that may be socially and medically desirable responses. However results indicate that health providers have concern for women and facilitating their delivery of health service is important in improving reproductive health in Uganda.

Implications and Recommendations

There is an urgent need to raise awareness among women of childbearing age about the importance of prenatal visits. In addition, health services that are acceptable to the women need to be identified to overcome barriers mentioned by health providers (low attendance, language barriers, and poverty). Women need to be educated to identify and

respond to complications that develop during pregnancy. Patients may be afraid of health providers due to the gap in education, therefore women should be taught that health providers are there to help them achieve good health and successful pregnancy outcomes are important. Health care providers need to develop ways to involve women in the decision-making process during pregnancy. Health providers need to improve their delivery of antenatal care services, recognize risk factors to prenatal care attendance such as poverty, long distances to health services, access to transport, availability of food, childcare, high parity mothers, and false sense of security from previous successful childbirths.

In developing countries such as Uganda, where maternal morbidity and mortality is high, it is important for health providers to provide education and advice regarding pregnancy. The concerns raised by health providers indicate an urgent need to intervene in these areas. The issues observed by health providers cannot be overcome through prenatal care alone. Government support is needed to decrease these barriers so as to provide improved and effective prenatal care. Bringing health services closer to the rural women is likely to reduce travel distances and transport costs to heath care facilities. However, with the recent recommendations by the World Health Organization, four visits with more focused assessment of the women's problems may reduce the burden and may increase antenatal care visits (Villar et al., 2001; Piaggio et al., 1998).

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Table 1. Nutrition-and Health-Related Concerns Identified by Health Providers

Obstetricians (n=21)	Nurse-midwives (n=32)
Poor diet (10)	Poverty (19)
Cultural traditions (4)	Poor diet (12)
Poverty (2)	Lack of knowledge (9)
Others (2): ill health, lack of maternal outreach programs	Ill health (7)
	Large family size (7)
	Poor hygiene practices (5)
	Others: Weight gain (3); dehydration (2); culture; poor ANC attendance; civil strife

Table 2. Health Providers' Concerns about Maternal and Health Institutions in Uganda

Obstetricians' Concerns (n=21)	Nurse-midwives' Concerns (n=32)
High maternal morbidity and mortality (4)	General education or information
Low maternal education levels (3)	dissemination (23)
Poor ANC attendance (3)	Maternal behaviors (11)
Institutional issues (3):	Increase health facilities (10)
Inadequate medical supplies (2)	Early sex education (6)
Others: Teenage and unplanned pregnancies	Low ANC attendance (6)
(3), poverty (3), time, and high patient	Increase in number of workers (5)
load	Pregnancy nutrition and diet (4)
	Importance of hygiene (3)
	Other: Spouse non participation,
	maternal illiteracy

Table 3. Health Care Providers' Opinions of Hindrances to Effective Health Care Delivery to Pregnant Women

Obstetricians (n=21)	Nurse-midwives (n=32)
High patient load (10)	High patient load (16)
Inadequate time to discuss issues (7)	Inadequate facilities (7)
Communication barriers (4)	Inadequate transportation (7)
Time (4)	Ignorance (6)
Cultural beliefs and traditions (3)	Communication barriers (5)
Illiteracy (3)	Cultural traditions (5)
Inadequate supplies (3)	Poverty and availability of drugs (4)
Other (5): Late ANC attendance,	Others (14): Inadequate materials and
poverty,	equipment,
poor access to health,	poor ANC attendance,
poor maternal outreach programs,	lack of nutritional care support,
ignorance.	protection against infectious diseases,
	poor healthcare quality.

Table 4. Health Providers Perceived Benefits of Maternal Alcohol Consumption

Obstetricians (n=21)	Nurse-midwives (n=32)
No alcohol benefits (12)	Fetal and maternal harm (29)
Maternal and infant concern (6)	No benefits (20)
Alcohol benefits (6):	Nutritional and financial disadvantages (17)
increased appetite (2), psychosocial	Physical effects –injury (6)
(2), and social drinking	ANC attendance (3)
Low birth weight infant (5)	Alcohol benefits (2)
Family concern: Financial misuse	

Table 5. Perception's of Health Providers' Pertaining to Maternal Beliefs about Alcohol Consumption

Obstetricians (n=21)	Nurse-midwives (n=32)
No alcohol benefits (10)	Clean baby with a good skin (16)
Alcohol benefits (6): good infant skin,	Psychosocial (12)
pain relief	Quick and easy child birth (7)
Lack of knowledge about harmful	Increased baby size (5)
effects of alcohol (3)	Social drinking (3)
Low pregnancy alcohol use (3)	Others: Pain relief (2), prestige,
Addiction problem	nutrition benefit, addiction problem

CHAPTER VIII

DIFFERENT NUTRITION-RELATED ADVICE IS GIVEN TO PREGNANT WOMEN BY OBSTETRICIANS AND NURSE-MIDWIVES IN KAMPALA, UGANDA

ABSTRACT

Objective: To determine differences between doctors (MDs) and nurse-midwives (RNs) in prenatal nutrition-related advice and health concerns of low-income pregnant women in Kampala.

Design: MDs and RNs completed a self-administered survey.

Subjects/Setting: A convenience sample of MDs (N=21) and RNs (N=32) working with pregnant women in a government hospital in Kampala.

Statistical Analyses Performed: T-test analyses were conducted to examine differences between MDs and RNs.

Results: RNs indicated significantly more nutrition-related concerns about pregnant women (6.2±1.0) than MDs (3.3±1.9). RNs were significantly more likely than MDs to indicate concerns about poor pregnancy nutrition, herbal and clay use; and ignorance about the fetal alcohol effects, low maternal weight gain, and infant LBW. RNs gave nutrition-related advice (35.1±3.8) significantly more often than MDs (27.6±6.1). RNs' nutrition-related advice was given significantly more often than MDs' advice on suitable

foods for pregnancy, alcohol use, fetal and maternal alcohol effects, and fetal and maternal clay effects. MDs' advice was given significantly more often for clay use during pregnancy.

Conclusion: RNs indicated more concerns regarding pregnant women's health-related issues and were more likely to give advice than MDs.

Implications: Study findings provide evidence for the need for consistency in prenatal nutrition message delivery by MDs and RNs.

INTRODUCTION

Antenatal (prenatal) care (ANC) is medical care provided during pregnancy to address both the psychosocial and the medical needs of the woman, within the context of the health care delivery and the culture in which she lives (World Health Organization (WHO), 1994). ANC is designed to detect and manage problems during pregnancy, and to improve the chances of having a healthy baby by providing information and counseling on how to stay in good health. ANC is designed to establish good relations between the women and their health care providers (WHO, 1994). The greatest effect of ANC attendance is increased length of pregnancy, thereby decreasing the number of preterm deliveries (Sable and Herman, 1997). During routine antenatal care, women should be advised to consider breastfeeding; reduce or stop alcohol use; reduce or stop smoking; avoid use of illegal drugs; consume appropriate foods to meet nutritional demands of pregnancy; take vitamin or mineral supplements; and gain an appropriate amount of weight (U. S. Department of Health and Human Services, 1989). ANC should also include timely medical care for complications and complementary measures to

overcome problems related to widespread diseases and deficiencies (Safe Motherhood Inter-Agency Group 2002). Women in developing countries lack access to adequate care during pregnancy with only 63% receiving care in Africa compared to 97% in developed countries (UNICEF, 2002)

The national health policy in Uganda incorporates principals of the Safe Motherhood Initiative with the goal of reducing maternal mortality by 30% over the next 5 years. Safe Motherhood promotes safe and healthy pregnancies and deliveries for women by providing high-quality maternal health services to all women. The Safe Motherhood Initiative aims to reduce deaths and illnesses among women and infants, especially in developing countries. Included in the Safe Motherhood Initiative aims are improving antenatal, obstetric, and postpartum care (Safe Motherhood Inter-Agency Group 2002).

The nutrition related components of prenatal care given by health providers in Uganda have not been investigated. Of particular interest were behaviors including the socio-cultural practices of consumption of herbal medicines, clay, and alcohol. Certain sociocultural practices and particular behaviors by women are known to affect reproductive health (Ojofeitimi and Tanimowo, 1980; Okafor, 2000). Fetal Alcohol Syndrome is among the preventable cause of mental retardation (Hankins, 2002; Larkby and Day, 1997). The use of clay and herbs may impair nutrient intake (Wiley and Katz, 1998; Mitchell, 1997) and may contain substances that are harmful to the mother and the fetus (Mabina et al., 1997). The objectives of this study were to determine the differences in nutrition-related advice provided by two key provider groups (nurse-midwives and obstetricians/gynecologists) and to determine the differences in perceptions of two key provider groups regarding prevalent health related concerns of pregnant women. The

study specifically examined nutrition advice given for geophagia, herbal medicine, and alcohol use during pregnancy.

METHODS

Sample and Procedure: The study was conducted in a large metropolitan government owned hospital in Kampala district, central Uganda. The district has a projected population of over 1 million (Uganda Ministry of Finance and Economic Planning, 1991) distributed over 331,900 square kilometers. To address study objectives, a purposive sample of nurse-midwives (n=32) and obstetricians (n=35) who worked in perinatal care were contacted during June 2001. Information about the present study was announced during meetings in the Department of Gynecology to solicit obstetricians' and nurse-midwives' participation in the study. A cover letter and survey were distributed with a return self-addressed envelope; the letter requested study participants to complete and return the questionnaire to a specified location. Professionals were reminded to return the survey during the meeting. A second survey was distributed to non-respondents two weeks after the initial distribution (Dillman, 2001). Oklahoma State University Institutional Review Board, The Uganda National Council of Science and Technology, and Mulago Hospital Administration and Department of Gynecology reviewed and approved all study methods.

Instrumentation: The principal investigator based on the study objectives developed the questionnaire. The questionnaire examined the nutrition advice incorporated in routine antenatal care and perceptions of providers about the health concerns of pregnant women. One pilot test of the survey instrument was conducted with 3 nutrition education students

and 5 healthcare workers not included in the study. Based on the responses from the pilot, adjustments were made to the questions. Content validity was verified by two professors in the department of Nutritional Sciences at the Oklahoma State University.

To examine the perceptions of healthcare providers regarding prevalent health related concerns, nurse-midwives and obstetricians indicated which nutrition and health issues were prevalent in their patients. The questionnaire consisted of 18 closed-ended questions. A scale of 1 to 4 was used to indicate the frequency with which healthcare providers gave nutrition related advice to pregnant women with "no-1, rarely-2, sometimes-3, and usually-4". Scores were calculated by summing the responses given for each response for all health care providers. Cronbach's alpha was 0.77 for the 10-item construct of advice given by health providers and 0.74 for the 8-item construct of health concerns among pregnant women.

Statistical Analysis: SPSS (Statistical Package for the Social Sciences) 11.0 for Windows (2002) was used for analysis. The number of concerns and frequency of advice were totaled and t-tests were employed to determine the differences between nurse-midwives and obstetricians.

RESULTS

Subjects: Out of 67 questionnaires distributed to health providers working directly with pregnant women and new mothers in a government owned hospital in Kampala, 32 nurse-midwives and 21 obstetricians completed the self-administered survey. Overall health providers' response rate was 79%. The response rate for nurse-midwives was 100% and for obstetricians was 60%. On average, nurse-midwives were about 6 years older than the

obstetricians (Table 1). Most health providers resided in the city suburbs and most were employed fulltime.

Health providers indicated they usually gave advice to pregnant women about use of clay in pregnancy, suitable foods to eat during pregnancy, alcohol's harmful effect on the mother and baby, and the need to cut down or avoid clay and alcohol consumption during pregnancy (Table 2). Equal numbers of health providers usually advised and never advised that clay is good for the pregnancy and clay can affect food intake (Table 2).

Nurse-midwives reported giving advice on nutrition-related topics significantly more often compared to obstetricians ($p<.001$). An examination of the differences in type of nutrition-related advice provided by health providers showed that nurse-midwives gave nutrition-related advice significantly more often than obstetricians on 8 of the 10 items (suitable foods to eat during pregnancy, fetal and maternal effects of alcohol consumption, reduce or eliminate alcohol and clay consumption, fetal and nutritional effects of clay consumption) (Table 3). Obstetricians reportedly gave advice significantly more often about clay use being good for the pregnant women. Both types of health providers reported giving advice about poor eating habits.

Prevalent health related concerns for pregnant women identified by most health providers were clay consumption, poor diets, low maternal pregnancy weight gain, lack of knowledge of risks of low birth weight, and alcohol effects, and excessive use of herbal clay. Alcohol consumption and use of illegal drugs were perceived to be of lesser concern (Table 4).

Nurse-midwives were significantly more likely than obstetricians to indicate concerns about clay consumption; low weight gain; lack of knowledge about harmful

effects of alcohol consumption, and risks of low infant birth weight; and excessive consumption of herbal clay (Table 5). Results showed that nurse-midwives identified more health concerns (6.2±1.0) as being prevalent among pregnant women than obstetricians (3.3± 1.9) (p=.001).

DISCUSSION

The type and quality of antenatal care that women receive is important. The present study shows that during antenatal care, health providers reported that they usually advise women on the proper diet to consume in pregnancy; alcohol's effect on the mother and fetus; and the need to reduce or avoid clay and alcohol consumption during pregnancy. This advice is in concert with recommendations for antenatal care: to reduce or avoid alcohol consumption, to eat proper foods during pregnancy (Expert Panel on the Content of Prenatal Care, 1989). Health care providers advice to pregnant women in these areas are important because they are major preventable risk factors for low birth weight, mental retardation, and fetal and infant deaths (IOM, 1990).

Significant differences were observed in the advice given by type of health provider. The present study showed that the nurse-midwives implemented the advice more often than the obstetricians. It can be suggested that nurse-midwives are more aware of the type of nutrition related advice to give to pregnant women than doctors for the following reasons: a) nurse-midwives were women of childbearing age and may have had similar experiences during pregnancy; and b) in a developing country such as Uganda, the low doctor to patient ratio leaves the nurse-midwives to work more often one-on-one with pregnant women. This close interaction between nurse-midwives and pregnant women

may have exposed nurse-midwives to women's issues and may have prompted them to provide advice during antenatal care. Hence nurse-midwives often gave nutrition advice and indicated a significantly higher number of health issues of concern among pregnant women. In the present study, obstetricians gave advice significantly more often than nurse-midwives on only one item; "clay is good for pregnant women." Responses to the survey did not indicate what type of advice MDs gave about clay, they could tell women the statement was true or not true.

Piaggio et al. (1998) found variable prenatal care between health providers in Argentina, Cuba, Saudi Arabia, and Thailand. In a study to determine the quality of screening during antenatal care, of 330 pregnant women, 55% had one risk factor and 31% had more than one risk factor. There was a discrepancy in the quality of determination of the risk factors by midwives (Prual et al., 2000). Midwives did not all screen height, blood pressure, glycosuria, vaginal bleeding, edema, parity, age, previous caesarean section, stillbirth, or miscarriages (Prual et al., 2000).

The present study showed that health providers were concerned about the health of the pregnant women in regards to clay consumption, poor diet, poor weight gain, lack of knowledge about the risks of low birth weight and alcohol effects and consumption of herbal clay. These concerns reflect the type of advice they reported providing during the prenatal care.

Clay consumption was seen as a problem by most of the providers. Some studies indicate that clay intake can influence nutritional status of consumers. Clay consumption has been implicated in impaired mineral intake through the process of chelation, hence making minerals unavailable for utilization (McLoughlin, 1987; Edwards et al., 1964;

O'Rourke et al., 1967; Wiley and Katz, 1998). Consumption of clay in large amounts may replace normal food intake (Mitchell, 1997). This means that the mother may not meet nutrient needs that are increased by pregnancy because of reduced food intake. Lastly, clay may cause gastrointestinal obstruction due to its adsorbent nature. Potential risks reported for excessive clay consumption were intestinal obstruction, perforation, and including death (Lacey, 1990; McLoughlin, 1987).

Most MDs and RNs in the present study gave advice to pregnant women about maternal diet. Maternal diet is an important correlate to pregnancy outcome in developing countries (IOM, 1990). According to the IOM (1990) nutritional advice should include the assessment of food habits, dietary patterns, maternal weight gain indicators, and other contributing factors among pregnant women.

Poor weight gain was a concern among health providers. Low maternal weight gain is a risk factor for low infant birth weight and its associated risk factors (IOM, 1990). Several factors such as low income, heavy work with inadequate energy intake, and being single contribute to low weight gain during pregnancy (Worthington-Roberts and Williams, 1997; IOM, 1990; Ministry of Health, 1999) and need to be explored by health providers. In order to increase weight gain during pregnancy, these contributing risk factors need to be identified and discussed during prenatal care visits.

Health providers were concerned about women's lack of knowledge of the risks infant face when born below normal weight. The Uganda National Food and Nutrition Council (1996) reported that 16% of infants are born weighing less than 2500 gm. Infants born with low birth weight face an increased risk of neonatal mortality due to complications of respiratory distress syndrome, poor body temperature control, salt and

water imbalances, low blood sugar, jaundice, brain damage, anemia, heart problems, and intestinal inflammation (Abel, 1997). Increasing women's awareness of the increased risk of morbidity and mortality in low birth weight infants face may promote desirable maternal behaviors that are conducive to successful pregnancy outcomes. Most mothers usually look forward to having a healthy baby. Mothers need to know that an adequate diet (IOM, 1990; Klebanoff et al., 1991; Scholl and Hedigar, 1994), abstinence from use of alcohol (Nandi and Nelson, 1992; Abel, 1997), abstinence from clay consumption (Geissler et al., 1998: Simpson, 2000), not smoking (Pollack et al., 2000; Rozenzweig and Schultz, 1982; Kleinman, 1990; Wilcox 1993); increasing use of prenatal care services (Sable and Herman, 1997; IOM, 1985; Day et al., 1989; Larroque et al., 1993), not using illegal drugs, (Ornoy, 2002; Robins and Mills, 1993) and better income and low maternal stress (IOM, 1985; Kopp and Kaler, 1989) lead to sound reproductive health. Women need to be educated about these risk factors to limit the number of low birth weigh infants and associated risk factors of morbidity and mortality.

In the present study, health providers identified the lack of knowledge among pregnant women about the effect of alcohol use as an important health problem. Health providers advised women to reduce or cut down on alcohol use. Fetal alcohol syndrome (FAS) is the most preventable form of mental retardation (Hankins, 2002; Streissguth, 1994). The amount of alcohol and the mechanism by which alcohol affects fetal growth has not been established (IOM, 1990). The effect of alcohol intake on fetal development may be related to decreased dietary intake, impaired metabolism and absorption of nutrients, and altered nutrient activation and utilization (IOM, 1990), timing of alcohol exposure, and maternal and fetal genetics (U. S. Department of Human and Health

Services, 2000). Efforts to encourage women to limit or eliminate alcohol intake during pregnancy need to be promoted because of the adverse effects alcohol can have on the developing fetus.

The results of the study indicate that there are concerns among health care providers about women's reproductive health that call for immediate intervention. This study provides some information about the variable delivery of care by the two key provider groups. Results showed differences between nurse-midwives and obstetricians in their perceptions of health issues present in pregnant women and in their delivery of prenatal care advice. Obstetricians listed fewer health concerns among pregnant women and were less likely to give nutrition-related advice during prenatal care than nurse-midwives.

The results of the present study may not be generalizable due to the size of the sample. Caution should be exercised in extrapolating these findings to all health care providers in Uganda. The measures of advice provided may be biased by over reporting of advice.

Health care providers play an important role in assisting pregnant women to change behaviors that influence successful pregnancy outcomes. It is important for healthcare providers to convey health advice in a uniform manner. To achieve consistency in message delivery, we recommend training for all providers of antenatal care and the development of standard procedures and guidelines that will streamline antenatal care. For effective care, it is important for health care providers to identify those health-related factors that increase the risk of poor reproductive health so as to target effective intervention measures.

This study provides some baseline information about prenatal advice given by health providers and their concerns about women's health-related issues. Results hold important implications for the practice of health care in reproductive health in Uganda. Routine screening and assessment in prenatal care needs to incorporate traditional practices and the friendly support of the health care providers. Research in additional settings is needed to best determine the exact roles of the two key provider groups in prenatal care and the overall content of prenatal care. Such information may be used to standardize the content of prenatal advice and have guidelines for uniform delivery to pregnant women.

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Table 1. Health Provider Demographic Information

Characteristics	Frequency (n)	Percent (%)
Type of health provider		
Nurse-midwives	32	60.4
Obstetrician	21	39.6
Place of Residence		
Rural	6	11.5
Suburb or town	28	53.9
City	18	34.6
Employment status		
Fulltime	46	66.5
Part-time	2	3.8
Other	4	7.7
		Mean ±SD
Age (in years) (n=48)		38.3±9.1
Nurse-midwives (n=27)		41.0±9.2
Obstetricians (n=21)		34.8±7.8

Table 2. Frequency of Healthcare Providers' Advice Regarding Nutrition-Related Topics Provided to Pregnant Women In Routine Antenatal Care (N=53).

	Never % (N)	Rarely % (N)	Sometimes % (N)	Usually % (N)
Clay is good for pregnant woman	1.9 (1)	5.7 (3)	0.0 (0)	92.5 (49)
Suitable foods in pregnancy	1.9 (1)	5.8 (3)	21.2 (11)	71.2 (37)
Alcohol can harm mother	8.0 (4)	6.0 (3)	24.0 (2)	62.0 (31)
Alcohol can harm baby	5.7 (3)	9.4 (5)	26.4 (14)	58.5 (31)
Cut down or avoid clay	7.5 (4)	1.9 (1)	32.1 (17)	58.5 (31)
Cut down or avoid alcohol	5.7 (3)	7.5 (4)	32.1 (17)	54.7 (29)
Poor eating habits harm pregnancy	15.7 (8)	3.9 (2)	27.5 (14)	52.9 (27)
Clay can harm the baby	9.4 (5)	9.4 (5)	30.2 (16)	50.9 (27)
Clay is good for pregnancy (fetus)	41.5 (22)	0.0 (0)	17.4 (9)	41.5 (22)
Clay can affect food intake	33.3 (17)	9.8 (5)	21.6 (11)	35.3 (18)

Table 3. Differences in Frequencies with which Nutrition Advice was Given by Healthcare Provider.

Health Advice Given	Obstetricians (n=21)	Nurse-midwives (n=32)	p-value
Clay is good for pregnant woman	4.0±0.0	3.7±0.8	.048
Suitable food in pregnancy	3.0±1.1	3.9±0.3	.001
Alcohol can harm mother	2.7±1.2	3.5±1.1	.014
Alcohol can harm baby	2.9±1.0	3.7±0.6	.001
Cut down or avoid clay	3.1±1.2	3.7±0.5	.032
Cut down or avoid alcohol	3.0±1.0	3.6±0.7	.012
Poor eating habits harm pregnancy	3.3±0.9	2.9±1.4	.147
Clay can harm the baby	2.9±1.2	3.5±0.8	.040
Clay is good for pregnancy	1.1±0.7	3.5±0.8	<.0001
Clay can affect food intake	1.6±1.0	3.1±1.3	<.0001
Total score for health advice [1]	27.6±6.1	35.1±3.8	.001

[1] Score was calculated by summing the responses given for each response 1=no, 2=rarely, 3=sometimes, 4=usually, for all healthcare providers.

Table 4. Reported Health Issues Between Obstetricians and Midwives in Health Issues of Pregnant Women (n=53)

		Differences		
Health providers issues/concerns	Total	Obstetrician % (n)	Midwife % (n)	p-value
Clay consumption	86.8 (46)	71 (15)	97 (31)	<.05
Poor diet during pregnancy	86.8 (46)	76 (16)	94 (30)	.065
Low weight gain in pregnancy	77.4 (41)	57 (12)	91 (29)	<.05
Lack of knowledge of risk of low birth weight	75.5 (40)	43 (9)	97 (31)	<.0001
Lack of knowledge about alcohol effects	73.6 (39)	38 (8)	97 (31)	<.0001
Excessive use of herbal clay	56.6 (30)	19 (4)	81 (26)	<.0001
Alcohol consumption	37.7 (20)	24 (5)	47 (15)	.090
Use of illegal drugs	9.4 (5)	5 (1)	13 (4)	.346

CHAPTER IX

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this chapter is to present a summary of the data collected and analysis of the data, conclusions drawn from the data, and recommendations for future research. The purposes of this research were to investigate maternal beliefs, perceptions, and frequency of the consumption of smoked clay, herbal clay, and alcohol, and to examine healthcare providers' advice in relation to maternal practices of smoked clay, herbal clay, and alcohol consumption.

To gather data, this study employed focus group discussions, face-to-face interviews, and self-administered surveys. Thirty-seven women in a community setting participated in the focus group discussions. Fifty-nine newly delivered mothers were individually interviewed in a hospital and 53 health care providers in the same hospital completed the self-administered survey. The women in the community were contacted through their local community leaders, newly delivered mothers were contacted through nurse-midwives in charge of the maternity units, and health practitioners were contacted by hand delivered mail.

Table 1 provides a summary of the information about consumption of smoked clay, herbal clay, and alcohol by community women, newly delivered mothers, and health care

professionals' advice provided. Table 2 provides a summary of the beliefs about smoked clay, herbal clay, and alcohol consumption of community women, newly delivered mothers, and health care professionals' advice.

Smoked Clay and Herbal Clay

Focus group discussions generated information regarding the traditional strategies women employed to have an easy pregnancy and a healthy baby. Among the strategies employed were the consumption of smoked clay to satisfy cravings and to alleviate pregnancy discomforts such as nausea, saliva, and vomiting. Small pieces of clay broken off a block of smoked clay were consumed almost daily throughout pregnancy. The consumption of herbal clay was mainly for maternal and infant health. Women believed that herbal clay shortened labor and eased childbirth. Early use of herbal clay was for maternal good health, use during the last trimester was to loosen the pelvic bones to ease childbirth, and use at the end of pregnancy was to promote labor. Fetal benefits of maternal use of using herbal clay were prevention and treatment of skin infections.

Face-to-face interviews with newly delivered mothers showed that half consumed smoked clay and almost all consumed herbal clay. Results supported the views raised in focus group discussions for use of clay and herbal clay. The majority of the newly delivered mothers used smoked clay and herbal clay for the same reasons as the community women. Most women believed that consumption of smoked clay or soil was a craving and clay consumption reduced nausea, vomiting, and saliva. Most women consumed herbal clay mainly for health reasons as distinguished from clay consumption. Most women did not believe that the consumption of smoked clay and herbal clay posed

any health risks. However, excess consumption of smoked clay was associated with maternal constipation and birth of a baby matted with clay, and the poor preparation and/or the premature use of herbal clay was associated with painful loose bone joints, premature labor, and ruptured uterus. Most of the behaviors reported by the women were passed on through family, friends, and traditional healers.

Health care providers were aware of maternal consumption of smoked clay and herbal clay in pregnant women. In regard to whether health care providers gave advice to pregnant women about their consumption of smoked clay or herbal clay, nurse-midwives were more likely to give advice than obstetricians to cut down or avoid smoked clay; smoked clay can harm the fetus; and smoked clay intake can affect food intake.

Alcohol Consumption in Pregnancy

Women in the focus groups reported using alcohol in moderation. Community women began to use alcohol in pregnancy because they either craved it or because they believed that it cleaned the baby. According to women in the focus groups, a particular alcohol distillate, waragi, was consumed because it cleaned the baby and conferred a good skin. Women believed that other locally brewed beverages and commercial beer increased the baby's size. Community women were not aware of the adverse effects of alcohol on the fetus. Most women did not believe that the consumption of alcohol posed any health risks.

Newly delivered mothers were more aware of the effects of alcohol such as brain damage than the community women. In both groups, many women used alcohol before pregnancy and some continued to use alcohol during pregnancy. Newly delivered

mothers differences in responses may be due to slightly higher education levels and/or their behavior of seeking health services by attending antenatal care compared to that of community women. Newly delivered mothers indicated receiving advice from health care providers to reduce or avoid alcohol and the maternal and fetal adverse effects of alcohol.

More nurse-midwives than obstetricians were aware of maternal consumption of alcohol. Nurse-midwives were more knowledgeable than obstetricians about the women's beliefs and reasons for use of alcohol during pregnancy. In regard to whether health care providers gave advice to pregnant women about their consumption of alcohol, nurse-midwives were more likely to give advice than obstetricians about the harmful effects of alcohol on the mother and the fetus and to advise the pregnant women to cut down or avoid alcohol. Most health care providers listed the effects of alcohol consumption with poor pregnancy outcomes such as low birth weight and brain damage associated with fetal alcohol syndrome.

Conclusion

This study described nutrition-related behaviors of smoked clay, herbal clay, and alcohol consumption in women of childbearing age in Kampala, Uganda. Findings showed that most women consumed smoked clay and herbal clay, and alcohol in moderation during pregnancy. Most women believed that smoked clay was a craving and they consumed smoked clay to ease nausea, saliva, and vomiting. Herbal clay was consumed for health such as the prevention and treatment of illnesses and to ease childbirth and promote labor. Perceived harmful effects of smoked clay were maternal constipation and birth of a baby covered with clay. Perceived harmful effects of herbal

clay were painful loose joints, premature labor, and ruptured uterus. Although health providers reported the presence of these practices among pregnant women, they did not hold the same beliefs as the women. Health care providers, especially nurse-midwives, were aware of the reasons women engaged in smoked clay, herbal clay, and alcohol consumption and were more likely to provide advice related to these practices than obstetricians.

Limitations

The findings of this study were limited to Ganda women of childbearing age participating in this study and may not be generalized to other populations. Further limitations to this study include:

1. Other ethnic and tribal differences were not examined. It is possible that the practices of smoked clay, herbal clay, and alcohol consumption may be present or absent, and may be viewed differently from one ethnic group to the next and within the same tribe depending on the prevailing culture.
2. The use of self-reported measures of consumption of smoked clay, herbal clay, and alcohol by women and advice given by health care providers may affect study findings. Social desirability may have played a role in the responses of the community women, newly delivered mothers, and health care providers. Community women who participated in the focus group discussions were from the same social group and appeared to freely express opinions about their consumption of smoked clay, herbal clay, and alcohol. It is possible that their responses may over-report smoked clay, herbal clay, and alcohol consumption if they felt it was prestigious and

enhanced their social standing in terms of being able to afford the cost of the substances. On the other hand, newly delivered mothers may have perceived interviewers to be health care providers. They may have under-reported the presence of these practices and over-reported the amount of advice they received from health care providers by reporting socially and medically desirable responses. Similarly, health care providers may have reported what was desirable in their practice rather than what was actually practiced.

3. The convenience sample does not permit generalization to the larger population of Kampala District because of lack of random selection and therefore inadequate representation.
4. The small sample size was not representative of the Ganda women or the health care providers in the whole Kampala District.
5. No intercoder reliability was determined for content analysis. Reliability could be increased by use of computer software such as Ethnograph for content analysis.
6. The translation of the questionnaire from English to Ganda and vice versa may have resulted in loss and/or misrepresentation of information.
7. Use of a male as moderator and interviewer may have influenced women's responses.

Implications for Practice

1. The maternal practices revealed the need to immediately include the assessment of these practices during prenatal care so as to provide appropriate interventions.
2. Results of this study can be implemented by the health care providers into the preconception care services as perinatal primary prevention for Ugandan women who

plan to become pregnant. The early identification of these practices in preconception care can help identify risks and prepare specific interventions to improve pregnancy outcomes.

3. The results can also be used in prenatal care services as secondary prevention for women who are already pregnant in order to provide early intervention counseling.
4. This study may help to reduce the incidence of low birth weight and mental health in infants born to drinking mothers by educating health care providers to assess, identify, implement intervention strategies, and teach Ugandan women to practice better pregnancy nutrition practices.
5. Increased and uniform screening, assessment and intervention using the antenatal forum should match health care providers awareness of these practices in women. The development of messages that can lead to the reduction or cessation of these practices is important to improve maternal and infant health during and after pregnancy. Health care providers can begin to use their meetings to raise and discuss issues related to these practices in pregnant women and determine the best approach to employ in counseling women.

Recommendations

1. Further research is needed to establish if these prenatal behaviors are detrimental to pregnancy outcomes in this ethnic group and other ethnic groups in Uganda. A prospective design would be a better choice for future research of assessment of prenatal behaviors related dietary practices in the ethnic groups.

2. A further investigation of alcohol consumption by pregnant women and women of childbearing age is warranted to establish prevalence of alcohol use in this and other ethnic groups. This will necessitate the determination of types of alcohol, amount and frequency of use before conception and during gestation.
3. Further examination of the pharmacological and toxic properties of the named herbs used in pregnancy is warranted. This will provide a list by which health care providers can counsel women. In addition, a list of pharmacological properties will assist health care providers in prescribing drugs that may have interactions with the herbs.
4. Geophagia can be examined in a longitudinal study to examine how various levels of clay consumption affect the nutritional status of women and vice versa; and should include non-geophagus women. In addition, a controlled animal study may be employed to supplement findings. Furthermore, a retrospective study such, as this needs to be reinvestigated in other settings in Uganda. This retrospective study could identify other factors and behaviors in a small sample, obtain results quickly, and also discover cultural and emerging risky behaviors.
5. Preventive strategies to decrease alcohol use during pregnancy can be developed with additional knowledge of the factors that are associated with alcohol use in pregnancy.
6. A social marketing model may be employed to deliver public health education and evaluated to determine its impact on knowledge and behavioral change in relation to the practices in the present study. This should target women, health care providers, alcohol vendors, and traditional herbalists. The use of posters, opinion leaders, drama,

songs, and t-shirts may increase awareness and may lead to reduction or cessation of the practices.

7. Awareness campaigns regarding alcohol and herbs need to include alcohol vendors and traditional herbalists, respectively. This is to increase their awareness with respect to the way they dispense these substances to pregnant women and the potential risk these substances may hold for this group of women.
8. Awareness campaigns are also warranted in children in the community and schools. This is a culture that is passed from mother to daughter or from older women to younger women and by increasing awareness in children, behavior change may be achieved more successfully and future successful pregnancy outcomes may be secured if girls are educated before reaching puberty.
9. Lastly, further research is needed to develop culturally appropriate strategies that can be used to increase the knowledge of the potential danger of these practices and one that can bring about cessation of these practices among pregnant women and women of childbearing ages.

Table 1. A Summary of Reported Consumption by Community Women and Newly Delivered Mothers and Health Care Providers' Advice

Substances	Community Women	Newly Delivered Mothers	Health Care Providers	Implications
Smoked clay	Majority of women consumed smoked clay.	Half of the mothers consumed smoked clay Most consumed clay in 2nd and 3rd trimester	Half of the providers were concerned that women consumed smoked clay	Increase screening for clay ingestion
Herbal clay	Majority of women consumed herbal clay for health in early pregnancy and to promote labor and easy delivery in late pregnancy	Majority of women consumed herbal clay for health in early pregnancy and to promote labor and easy delivery in late pregnancy	Midwives were more concerned about the use of herbal clay during pregnancy than obstetricians	Increase screening for use of herbal clay Assess beneficial and harmful properties of herbal clay
Alcohol Use	Some women drank alcohol during pregnancy	Some women drank alcohol during pregnancy	Less than half of the health care providers were concerned about use of alcohol by pregnant women	Assess maternal alcohol use

Table 2. A Summary of Beliefs of Community Women and Newly Delivered Mothers and Health Care Providers' Advice

	Community Women	Newly Delivered Mothers	Health Care Providers Target Advice	Implications
Clay	Majority of women indicated no harmful effects of eating clay. A few mentioned the birth of baby covered in dirt	Majority indicated no bad effect Some women named constipation and birth of baby covered in dirt	Half provided advice to reduce of cut down clay	Increase awareness of effects of clay on food intake and nutrient bioavailability Use of effective mass education media e.g., social marketing using drama, songs, t-shirts, etc.
Herbal clay	Majority indicated no harm of consuming herbal clay	Early use was associated with early labor, painful bones, ruptured membranes	Not asked	Increase awareness of use of herbal clay in health care providers Provide uniform delivery of prenatal advice Social marketing model, mass education in appropriate forum, use opinion leaders Approach traditional herbalists
Alcohol	Not aware of any possible harm	Some awareness of physical injury from falling, brain damage, preterm delivery	Half usually advised women to reduce or avoid use of alcohol Most advised about the negative effects of prenatal and maternal alcohol use	Increase awareness of fetal and maternal effects of alcohol in women, vendors, and health care providers Social marketing, use opinion leaders, posters in drinking places

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APPENDICES

APPENDIX A

OKLAHOMA STATE UNIVERSITY

INSTITUTIONAL REVIEW BOARD

Oklahoma State University
Institutional Review Board

Protocol Expires: 4/29/02

Date Monday, April 30, 2001 IRB Application No HE0159

Proposal Title: NUTRITION-RELATED FACTORS AMONG WOMEN OF CHILDBEARING AGE IN UGANDA

Principal Investigator(s)

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Reviewed and Processed as: Expedited

Approval Status Recommended by Reviewer(s) : Approved

Signature :

Carol Olson, Director of University Research Compliance

Monday, April 30, 2001
Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX B

UGANDA NATIONAL COUNCIL OF SCIENCE AND TECHNOLOGY

Uganda National Council For Science and Technology
(Established by Act of Parliament of the Republic of Uganda)

Your Ref:..

Our Ref:..... MV.621..

*Date:*May 28, 2001

Ms. Betty A. Wakou
C/o Child Health and Development Centre
P. O. Box 6717
KAMPALA

Dear Ms. Wakou,

RE: RESEARCH PROPOSAL " NUTRITION RELATED FACTORS AMONG WOMEN OF CHILDBEARING AGE IN UGANDA "

The Uganda National Council for Science and Technology (UNCST) has approved the above research proposal for implementation. The approval will expire on **August 28, 2001**. If it is necessary to continue with the research beyond the expiry date, a request for continuation should be made to the Executive Secretary, UNCST.

Any problems of a serious nature related to the execution of your research project should be brought to the attention of the UNCST, and any changes should be submitted for UNCST's approval before they are implemented.

This letter serves as proof of UNCST approval and as a reminder of your responsibility to submit to UNCST timely progress reports and a final report on completion of the study.

Yours sincerely,

Julius Ecuru
for: Executive Secretary
UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

LOCATION/CORRESPONDENCE
PLOT 16, KAMPALA ROAD
UGANDA HOUSE, 11TH FLOOR
P. O. BOX 6884
KAMPALA, UGANDA.

COMMUNICATION
TEL: (256) 41-258499
FAX: (256) 41-234579
E-MAIL: uncst@starcom.co.ug
WEBSITE: http://www.uncst.go.ug

APPENDIX C

MULAGO HOSPITAL COMPLEX

TELEPHONE: 256-041-554008
Fax: 256-041-532591
E-mail: d-mh@uga.healthnet.org

IN ANY CORRESPONDENCE ON THIS SUBJECT PLEASE QUOTE NO. DFR/182

MULAGO HOSPITAL COMPLEX
P. O. BOX 7051
KAMPALA. UGANDA

THE REPUBLIC OF UGANDA

12th June 2001

Ms Betty Wakou
c/o Child Health & Development Centre
P. O. BOX 6717
Kampala

Re: Research onNutrition related factors among Women of Child bearing Age

This is to acknowledge receipt of your Study Proposal to conduct research in the Department of Obstetrics/Gynaecology in June and July which was received on 30 May 2001.

The Research Committee normally expect an executive summary of proposals clearly indicating research ethical issues. The Committee also expects to receive proposals early to be scrutinised.

Your proposal (though it falls short of this standard) has been registered and permission/consent is hereby given to you to conduct research in relevant areas in Mulago Hospital.

This letter allows you to contact the Head of Department and Units in Obstetrics and Gynaecology for further details regarding your study.

The committee expects a summary of your findings and recommendations.

Dr. G. Kikampikaho
DEPUTY DIRECTOR
for: ETHICS & RESEARCH COMMITTEE

C.C. Head Dept. of Obs/Gynaecology

APPENDIX D

FOCUS GROUP QUESTION GUIDE FOR

COMMUNITY WOMEN

Focus Group Questions

I. DEMOGRAPHICS/OPENING QUESTION

1. As we go around the room, please give your name and briefly tell us a little about yourself.

Probe: For example, where do you live and how many children you have.

II. GENERAL QUESTIONS ABOUT PREGNANCY

2. The first thing we want to talk about is "As mothers how important is having an easy pregnancy.

Probe: On a scale of 1 to 10 how much value would you say you place on having an easy pregnancy?
(1=little, 10=a great deal) Show participants the scale.

3. The first thing we want to talk about is "As mothers how important is having a healthy baby.

Probe: On a scale of 1 to 10 how much value would you say you place on having a healthy baby?
(1=little, 10=a great deal) Show participants the scale.

4. What do you think are some of the things a pregnant woman has to do in order to have a healthy baby?

Probe: What are some of the good things you have to do to have a healthy baby?

III PICA

5. Let's talk about certain traditional practices that women follow to have a healthy baby or an easy pregnancy.

Probe: What are some of these practices?

Probe: How helpful are these practices?

Probe: How did you learn about these practices?

Probe: From whom do you learn these practices?

6. Some women crave and may eat substances like clay, stones, young mangoes, starch, or ice, during pregnancy, what are your opinions about these behaviors among pregnant women?

First let us talk about the consumption of clay/'mumbwa' by pregnant women.

During what period of pregnancy does a pregnant woman start using clay/'mumbwa'?

Probe: What are some of the reasons women eat clay or soil or the things that I have mentioned?

Probe: Is this clay or soil obtained from any particular place? Does it have to be a special type of 'mumbwa'/soil or clay?

Probe: How much of this 'mumbwa'/soil or clay can a pregnant woman eat on a daily basis?

Probe: Is this 'mumbwa'/soil or clay prepared in a special way?

Probe: Is there anything that is added to the 'mumbwa'/soil or clay that will help a woman during pregnancy?

Probe: What is added? How does it help a pregnant woman?

V KNOWLEDGE OF THE EFFECTS OF ALCOHOL

6. Next I am going to ask you some general questions about alcohol and pregnancy. How much do you think it is safe for a woman to drink alcohol during pregnancy?

Probe: daily, one to two times a week, a few times a month or once a month, or it is never safe.

7. Of the available alcoholic drinks here, which type is the safe one that a pregnant woman can have? For each type of drink mentioned Explore how much is estimated to be safe.

Probe: Malwa. t*onto, waragi*, whiskey, gin, beer, wine?

8. How much alcohol do you think is safe for a woman to drink during pregnancy?

Probe: One, five, more than ten, no type of drink is safe.

9. During what stage of pregnancy do you think it is best for a pregnant woman to drink alcohol?

Probe: Which period of time during pregnancy do you think it is safe for the mother to drink alcohol?

Probe: Early pregnancy –1-3 months

Probe :Mid pregnancy – 4-6 months

Probe :Late pregnancy 7-9 months

10. What are some reasons why a pregnant woman should drink alcohol?

Probe: Like to reduce pain or to prevent a miscarriage?

11. What are some of the things that can happen to the mother or the unborn baby if a pregnant woman drank alcohol?

Probe: What can happen to the mother if she drank alcohol during pregnancy?

Probe: What can happen to the child if the mother drank alcohol during pregnancy?

12: What else can happen to a pregnant woman or the baby?

13. Thank you very much for your time. If there any comments you would like to make, they would be welcome.

APPENDIX E

DEMOGRAPHIC INFORMATION SHEET

FOR COMMUNITY WOMEN

Community Women Survey

The information in this form which would permit identification will be held in strict confidence and will be used for purposes stated for this study. It will not be released to others without your consent. Please answer all questions that apply to you

1. In which type of community do you live? (Check One)

   1 □ Rural 2 □ Town 3 □ Suburb 4 □ City

2 How old were you on your last birthday? _____

3. What is your marital status? (Check One).

   1 □ Single
   2 □ Married
   3 □ Living with a man
   4 □ Widowed
   5 □ Separated
   6 □ Divorced

4. Do you have a job?

   1 □ No 2 □ Yes

5. What is your job?

   _____

6. Which of the following describes your employment status? (Check One)

   1 □ Employed full-time
   2 □ Employed part-time
   3 □ Unemployed
   4 □ Housewife
   5 □ Other_____ Please specify.

7. What is the highest schooling you attained? (Check One)

1 □ No education
2 □ Primary □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7
3 □ Secondary School □ 1 □ 2 □ 3 □ 4
4 □ High School □ 5 □ 6
5 □ Technical School
6 □ College Graduate
Other_____Please specify.

8. How many adults aged 18 or older live in your house? Count yourself. _____

9. How many babies, children, or teens aged 17 or younger live in your house?

_____

10. How many children of your own do you have?

    □ 1 □ 2 □ 3 □ 4 □ more than 4

APPENDIX F

ANALYSIS WORKSHEET

Analysis Worksheet

Date of Focus Group	
Location of Focus Group	
Number and Category of Residents	
Moderator Name	
Asst. Moderator Name	

Responses to Questions

Question:

Brief Summary/Key points	Notable Quotes

APPENDIX G

FOCUS GROUP CODES WORDS AND DEFINITIONS

Code Word Descriptions for Clay and Herbal Clay Consumption

Code Word	Definitions
Medicine	Mention medicine in relation to medicinal effect of herbal clay (mumbwa) and herbs used to treat or prevent maternal and fetal illness Mention different herbs (8 or more) that are mixed in herbal clay
Herbs or herbal clay or mumbwa	Dried clay mixed with herbs Solid is ground into powder, mixed with water before drinking
Types of mumbwa	Mentioned in terms of the various mixtures of herbs and the diseases they can treat in the fetus/baby or mother including other non medicinal benefits
Easy pregnancy	Mention easy pregnancy in relation to maintaining good health during pregnancy
Healthy baby	Mention health of baby in relation to absence of illness
Easy delivery	Mention easy delivery in relation to delivering easily with complications of prolonged labor, C-section, or episiotomy
Soften and loosen bones	Mention loose bones in relation to use of herbal clay to ease child birth that is so they do not get stitches
Noga noga or enoga	Mentioned skin rash believed to be syphilis infection in new borns
Kyogero	Mentioned in relation to a herbal treatment given to the infant
Strength	Mentioned in relation to the energy pregnant women gets with use of herbal clay
Painful bones	Mention painful bones in relation to early or excessive use of herbal clay which leads to early softening and loosening of bones in preparation for childbirth
Traditional medicine men	Mentioned in relation with persons who prepare herbal clay

Code Word	Definitions
No over dose	Mentioned in relation to the absence of excess dose in using the herbal clay
Diseases/sickness	Mentioned diseases treated by herbal clay
Stage of pregnancy	Mentioned in relation to the different stages a woman can use clay and herbal clay
Tablets	Mentioned in relation to iron supplements given at the hospital that they throw away because of the belief that it enlarges the baby's head and increases nausea
Card	Mentioned in relation to a hospital card they get on their only visit to the antenatal clinic which assures medical help in case they get complications later on especially art delivery
Distinguish mumbwa	Mention that herbal clay is not distinguishable but rely of vendor or herbalist to provide directions for use
Parents	Mention own mothers helping in with pregnancy, clays and herbal clays to use
Aunt	Mention in relation to any respectable older woman that can give advice to pregnant women and newly delivered mothers
Friends	Mention friends helping with giving information about herbal clay used with success
Elder	Mentioned and implicated in teaching clay and herbal practices. Mothers, grandmothers, aunts, neighbors mentioned in teaching
Husband	Mention spouses ability to help or not to help
Health care professionals	Mention of health care providers' lack of support in use of herbal clay
No knowledge or don't know	Mention not knowing the effects of clay or herbal clay on the mother and fetus

Code Word	Definitions
No problem	Mention no problem in association with no bad effects of clay and herbal clay
Complications	Statements about perceived complications from use of clay and herbs
Tradition	Mentioned in relation to how practices of clay and herbs were already existing in society
Craving	Mentioned in relation with urge experienced that lead to consumption of clay
Thirst	Mention thirst in relation to use of herbal clay slurry in place of drinking water whenever thirsty
Flavor	Mentioned in relation to smell of smoked clay, soil of the kitchen wall, soil after a rain drizzle that increases the urge to eat it
Constipation	Mention constipation in relation to excess consumption of clay
Cost	Mention cost in terms of purchase of clay and herbal clay
Any time	Mention in relation to times when they can eat clay or drink herbal clay slurry
Dirt baby	Mention dirty baby in relation to mucous on baby and clay like covering on baby at birth
Sharing information	Statements on sharing information about clay and herbal clay that they used successfully
Credible	Mention in relation with vendor or traditional herbalists effectiveness of medicine
Trust	Mention that they trust herbalist because they can not have the motive to harm pregnant women
Sources	Mention in relation to where the clay or herbs are obtained
Bumba	Clay or soil that is kneaded, molded and smoke-baked

Code Words and Definitions for Alcohol Consumption

Code words	Definition
Type of alcohol	Tonto, Malwa, Beer, endiga, Waragi
Reasons for drinking	
Don't know	Drinks alcohol for no reason for drinking, just a drink
Thirst	Drinks alcohol to quench thirst
Preference	Drinks alcohol because one decides to drink or not to drink
Craving	Drinks alcohol due to an urge to drink alcohol
Pregnancy	Drinks alcohol because of pregnancy
Cleans baby	Drinks alcohol (waragi) because it cleans the baby of dirt, perhaps vernix
Sleep	Drinks alcohol to get sleep
Alcohol not used for	
Pain relief	Drinking alcohol does not take away pain at childbirth
Speeding delivery	Drinking alcohol does not speed up child birth
Alcohol benefits	
Waragi cleans baby	Waragi when drunk cleans the baby, baby has no dirt
Health baby	Fermented drinks confer health and large size to baby
Good health	Drinking alcohol can confer health to mother
Sleep	Drinking alcohol confers sleep to sleepless mother
How much to drink	
Not excessive	Drink alcohol in amounts that do not intoxicate
Tolerance	Amount of alcohol one can drink without getting intoxicated
Just dizzy	A stage of between get intoxicated
Abstain	To do with not drinking

APPENDIX H

SURVEY FOR NEW MOTHERS

Survey for New Mothers

The information in this form, which would permit identification, will be held in strict confidence and will be used for purposes stated for this study. It will not be released to others without your consent. Please answer all questions that apply to you. The questionnaire will take you about 30 minutes to complete.

The next questions are about your baby. First I would like to ask you about the time your new baby was born.

1. Before your new baby, did you ever have any other babies?

   1 □ No (Go *to #6*) 2 □ Yes

2. How many children of your own do you have?

   □ 1 □ 2 □ 3 □ 4 □ more than 4

3. Were the babies you had before your new baby born alive?

   1 □ No 2 □ Yes

4. Did the baby just before your new baby weigh 2.5 kg ***or less*** at birth? (*Confirm the weight*)

   1 □ No 2 □ Yes

5. Was the baby just before your new one born ***more*** than 3 weeks before its due date?

   1 □ No □ Yes

6. Did your new baby you just delivered weigh 2.5 kg or ***less at birth***?

   1 □ No □ Yes

7. When you visited the healthcare worker, what date were you told your new baby would be born?

   _____/_____/_____

   Date Month Year

8. When was your new baby born? _____/_____/_____

   Date Month Year

9. What was your new baby's weight _____kg

10. What problems if any, did the your new baby have at birth?

    _____

11. What problems if any did you have during the delivery of this child? (Probe: Give example, bleeding, prolonged labor, tired baby, c-section)

    _____

12. Just before you got pregnant, how much did you weigh? _____Kgs □ I don't know

13. How much weight did you gain during this pregnancy? _____Kgs

    1 □ I lost weight during my pregnancy 3 □ I don't know

    2 □ My weight stayed the same 4 □ Gained weight

14. Do you think your diet during your pregnancy met all your nutrition needs?

    1 □ Yes, very much 3 □ Not at all

    2 □ Sometimes 4 □ Don't know

Pregnant women usually believe that doing certain things will result in a healthy pregnancy. Please briefly tell us the beliefs in your culture about the foods and practices that should be done or avoided during pregnancy.

15. Tell us some of the beliefs that pregnant women usually have with regards to food.

a). For example, what food should a pregnant woman eat?

b). What foods should a pregnant woman avoid? Why?

16. What do you believe is the cause of having complications during pregnancy? Probe: Give example.

17. What do you believe are the benefits associated with a pregnant woman

a) ***eating well***?

b) **eating 'ebumba'**?

c) **taking 'emumbwa'**?

18 What do you believe are the problems associated with a pregnant woman

a) **eating 'ebumba'?**

b) **taking *'emumbwa'*?**

19 a). What do you believe are the benefits associated with a pregnant woman ***drinking alcohol***?
Probe on **benefits** of each type of alcohol.

Beer _____	Waragi _____
Kwete _____	Wine_____
Malwa _____	Whiskey _____
Tonto	

19 b). What do you believe are the problems associated with a pregnant woman ***drinking alcohol***?
Probe on **problems** of each type of alcohol as previous question.

Some lifestyle choices you make can affect your nutrition and your health now and in the future. Your nutrition can also have an important effect on your baby's health. Please answer the following questions based on answers that best apply to you.

20. During this pregnancy, did you experience any of the following? **(Check all that apply)**

1 ☐ Nausea *(okusindikirirwa emeeme)*	4 ☐ Constipation *(olubuto okwesiba)*	7 ☐ Decreased appetite (stage?) *(okukendeeza okulya emmere)*
2 ☐ Vomiting *(okusesema)*	5 ☐ Diarrhea *(ekidukano)*	8 ☐ Other _____
3 ☐ Heartburn	6 ☐ Increased appetite(stage?)	Please specify.

21. During this pregnancy, did you **crave** for any non-food substance like **'ebumba'**?

1 ☐ No 2 ☐ Yes

22. What did you crave? **(Check all that apply)**

☐ Clay	☐ Baking powder	☐ Other_____
☐ Termite soil	☐ Starch/raw rice	
☐ Stones/sand	☐ Baking soda	
☐ Soil from the kitchen wall	☐ Ice	Please specify

23. During this pregnancy, did you **eat** other non-food substances like **'ebumba'**?

1 ☐ No **(Go to #29)** 2 ☐ Yes

24. During what period of your pregnancy did you eat **'ebumba'**?

1 ☐ 1-3months
2 ☐ 4-6 months
3 ☐ 7-9 months
4 ☐ Throughout the pregnancy
5 ☐ I never ate clay

25. How often did you eat this substance **'ebumba'**?

1 ☐ Everyday 2 ☐ Sometimes 3 ☐ Never

26. What are some of the reasons that you ate this substance?

1 ☐ Craving 2 ☐ Tradition 3 ☐ Health reasons
4 ☐ Other _____ Please specify.

27. Did you eat this substance during, before, after meal times, or any time?

1 ☐ During mealtime 2 ☐ Before mealtime 3 ☐ After mealtime 4 ☐ Any time

28. How much of this **'ebumba'** did you eat in a day/week? _____/_____
day/week

29. Tell us how this **'ebumba'** is prepared before eating?

_____

_____

_____

30. During this pregnancy, did you **crave** for any non-food substance like **'emumbwa'**?

1 ☐ No 2 ☐ Yes

31. During this pregnancy, did you **eat** other non-food substances like **'emumbwa'**?

1 ☐ No **(Go to #38)** 2 ☐ Yes

32. During what period of your pregnancy did you eat **'emumbwa'**?

1 □ 1-3months
2 □ 4-6 months
3 □ 7-9 months
4 □ Throughout the pregnancy
5 □ I never ate clay

33. What type of **'emumbwa'** did you take?

_____ _____ _____

34. How often did you take this substance, **'emumbwa'**?

1 □ Everyday 2 □ Sometimes 3 □ Never

35. What are some of the reasons that you took this substance, **'emumbwa'**?

1 □ Craving 2 □ Tradition 3 □ Health reasons

4 □ Other _____ Please specify.

36. Did you eat this substance during, before, after mealtimes, or anytime?

1 □ During mealtime 2 □ Before mealtime 3 □ After mealtime 4 □ Any time

37. How much of this 'emumbwa' did you take? _____

38. Tell us how this 'emumbwa' is **prepared** before eating?

_____

_____

_____

Next, I would like to ask you questions about alcohol use. The questions are about drinking alcoholic beverages like beer, ale, wine, liquor, such as whiskey, gin, rum or vodka and cocktails or mixed drinks and local brew such *as waragi, tonto and malwa.*

39 a). Before you got pregnant did you ever drink alcohol?

1 □ No **(Go to #40 a)** 2 □ Yes 3 □ Other_____

39 b). During the *3 months before* you got pregnant, how often did you drink alcohol in an average week?

times per week □ I didn't drink then

40 a). During your pregnancy, did you drink any alcohol?

1 □ No **(Go to #43)** 2 □ Yes

40 b). What alcoholic beverage(s) did you usually drink?

□ *Waragi*	□ Beer	□ Whiskey
□ *Tonto*	□ Wine	□ Mixed drinks/cocktail
□ *Kwete*	□ Gin	Other _____
□ *Malwa*		

41 a). During the first 3 months of your pregnancy, how many alcoholic drinks did you have in an average week?

1 □ I didn't drink then **(go to # 43)**	4 □ I don't know
2 □ Less than 1 drink a week	3 □ Other_____
3 □ ____ drinks a week	

41 b). During the *first 3 months after* you got pregnant, how many times did you drink this alcohol at one sitting?

1 □ Times 2 □ I didn't drink then 3 □ I don't know

42a). During the *last 3 months* of your pregnancy, how many alcoholic drinks did you have in an average week?

1 □ I didn't drink then
2 □ Less than 1 drink a week
3 □ ____ drinks a week
4 □ I don't know

42 b). During the *last 3 months* of your pregnancy, how many times did you drink this alcohol at one sitting?

1 □ ___Times
2 □ I didn't drink then
3 □ I don't know

The next questions are about the prenatal care you got during your most recent pregnancy. Prenatal care includes visits to a doctor, nurse, traditional birth attendant (*mulerwa*), or other health care worker before your baby was born to get check-ups and advice about pregnancy.

43. Which healthcare worker did you visit recently for your prenatal care? _____

44. During any of your prenatal care visits, did a doctor, nurse, or other healthcare worker talk with you about any of the things listed below? Say **Yes** if someone talked with you about it or **No** if no one talked with you about it.

Advice you have received	No	Yes
a) What foods you should eat during your pregnancy?	□	□
b) How eating 'ebumba' is good for the baby?	□	□
c) How eating 'ebumba' could affect your pregnancy?	□	□
d) How eating 'ebumba' and/or other nonfood substances can affect how much food you eat?	□	□
e) How taking 'mumbwa' is good for the baby?	□	□
f) How taking 'mumbwa' could affect your pregnancy?	□	□
g) How taking 'mumbwa' and/or other nonfood substances can affect how much food you eat?	□	□
h) How drinking alcohol during pregnancy could affect your baby?	□	□
i) How drinking alcohol can harm your health?	□	□
j) How your eating habits could affect pregnancy?	□	□
k) How your baby grows and develops during pregnancy?	□	□
l) To cut down or avoid eating clay during pregnancy.	□	□
m) To cut down or avoid drinking alcohol during pregnancy.	□	□

Next I am going to ask you some general questions about alcohol and pregnancy.

45 a). Do you think it is safe for a pregnant woman to drink alcohol? _____

45 b). How often do you think it is safe for a woman to drink during pregnancy?

1 □ Daily
2 □ One to two times a week
3 □ A few times a month
4 □ Once a month
6 □ Never **(Go to #48)**
7 □ I don't know

46. How much alcohol do you think is safe for a woman to drink during pregnancy?

Number of drinks _____ Type of beverage_____

47. Which period of time during pregnancy do you think it is safe for a pregnant woman to drink alcohol?

1 □ Early pregnancy-1-3 months
2 □ Mid pregnancy 4-6 months

3 □ Last part of the pregnancy 7-9 months

48. What are some of the things that can happen to an unborn baby if a woman drinks alcohol during pregnancy?

_____ _____

49. Are you aware that an unborn child can be affected by drinking alcohol?

1 □ No 2 □ Yes

50. Have you heard about Fetal Alcohol Syndrome?

1 □ No 2 □ Yes

51. The following are beliefs and statements that women express about pregnancy. For each one please indicate whether you **AGREE** or **DISAGREE** with the following statements.

1 □ Disagree (D) 2 □ Not sure (NS) 3 □ Agree (A)

What is your opinion about these statements (Circle one as shown in the example below)

Belief statement	D	NS	A
a) Only pregnant women eat 'ebumba'.	1	2	3
b) All the harmful effects of alcohol on the developing baby happen in the early stages (first three months) of pregnancy.	**1**	**2**	**3**
c) Eating 'ebumba' makes the delivery of the baby easier.	1	2	3
d) Taking 'mumbwa' makes the delivery of the baby easier.	**1**	**2**	**3**
e) Eating 'ebumba' is a feeling a pregnant woman cannot help.	1	2	3
f) It does not matter how much weight a woman gains during pregnancy.	**1**	**2**	**3**
g) Eating 'ebumba' gives me a feeling of well-being.	1	2	3
h) Harmful effects of drinking alcohol can occur any time during pregnancy.	**1**	**2**	**3**
i) Eating 'ebumba' reduces saliva production in the mouth.	1	2	3
j) Eating ' ebumba' improves the taste of food.	**1**	**2**	**3**
k) If a pregnant woman reduces her drinking, her baby will most likely come out mentally alert.	1	2	3
l) Eating 'ebumba' satisfies hunger.	**1**	**2**	**3**
m) It is not a smart idea to get drunk if you are planning to get pregnant.	1	2	3
n) Eating 'ebumba' is as good as any other food.	**1**	**2**	**3**
o) Eating 'ebumba' helps to reduce the feeling of vomiting.	1	2	3
p) Eating 'ebumba' is just a craving with no other benefits	**1**	**2**	**3**
q) Whatever a woman craves, she should eat.	1	2	3
r) Eating 'ebumba' should be prevented among pregnant mothers who practice it.	**1**	**2**	**3**
s) Eating 'ebumba' provides health benefits to the pregnancy.	1	2	3

Belief statement	D	NS	A
t) If I gain less weight during pregnancy, I will have a smaller baby.	1	2	3
u) Eating 'ebumba' can make you get worms in the stomach.	**1**	**2**	**3**
v) Worms in the stomach cause a pregnant woman to eat 'ebumba'.	1	2	3
w) A pregnant woman craves 'ebumba' because she is not getting enough of certain nutrients.	**1**	**2**	**3**
x) If a woman drank during her last pregnancy and had a healthy baby it means that her next baby won't be harmed by alcohol.	1	2	3
y) A woman craves clay when the diet is low in minerals	**1**	**2**	**3**
z) Low birthweight babies are mostly the fault of the mother.	1	2	3
aa) A woman should not gain excessive weight during pregnancy.	1	2	3
bb) Hard liquor (waragi, whiskey) is more harmful to the baby than beer or wine.	1	2	3
cc) Waragi helps to clean the baby	**1**	**2**	**3**

52. In which type of community do you live? (Check One)

1 □ Rural 2 □ Town 3 □ Suburb 4 □ City

53. When were you born? _____

Probe: Are you <30 or > 30 years old? _____

54. What is your marital status? (Check One).

1 □ Single
2 □ Married
3 □ Living with a man
4 □ Widowed
5 □ Separated
6 □ Divorced

55. Do you have a job?

1 □ No (Go to #58) 2 □ Yes

56. What is your job?_____

57. What is the highest schooling you attained? (Check One)

1 □ No education
2 □ Primary □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7
3 □ Secondary School □ 1 □ 2 □ 3 □ 4 □ 5 □ 6
4 □ High School
5 □ Technical School
6 □ College Graduate
7 □ Graduate School
8 □ Other_____
Please specify.

58. How many adults aged 18 or older live in your house? Count yourself. _____

59. How many babies, children, or teens aged 17 or younger live in your house?

Thank you very much for your time and help.

Any other comments or suggestions you think may help future women.

APPENDIX I

COVER LETTER FOR HEALTH CARE PROVIDERS

OKLAHOMA STATE UNIVERSITY

OSU

Department of Nutritional Sciences
425 Human Environmental Sciences
Stillwater, Oklahoma 74078-6141
405-744-5040, Fax 405-744-7113
Email nutrsci-i@okstate.edu
http://www.okstate.edu/hes/nsci/

Date: June21, 2001

Dear Dr./Mr./ Mrs./ Ms. _____,

I am a doctoral student at Oklahoma State University, currently doing my study concerning the knowledge and beliefs of pregnant women regarding nutrition related factors and prenatal care use. Past studies have documented that some practices lead to the good health of the mother and her child while other practices are harmful. Few studies have been carried out to ascertain the effects of nutrition-related practices and prenatal care practices among women in Uganda. With the rapid changes in society and culture, the question arises as to what are the good and what are harmful nutrition-related practices that affect a woman and her unborn child? The goal of this project is to determine various maternal practices. In addition the study will examine the prenatal advice you offer the women during their routine prenatal visits.

As a person that provides health care to expectant mothers we are asking you to give a few minutes of your time and fill out the following survey. This survey is to help us evaluate the prenatal care factors that health professionals may need in working with expectant mother in order to positively affect their unborn child. We would like to ask that you to give us your honest response regarding prenatal care practice. It will take no more than 15 minutes of your time to fill out the survey. For the results of the study to truly represent the practice of professionals it is important that each survey be completed and returned.

Your participation in this study is very important because of your position as a health care professional. Your contribution will serve to develop strategies that will help future mothers to bring to term successfully, healthy babies.

You may be assured of complete confidentiality. The survey has an identification number so we will know when yours is returned. Your name will never be placed on the survey itself.

Please complete the enclosed questionnaire and return it in the enclosed self-addressed envelope to the Child Health Development Centre by June 30, 2001.

Thank you for your time, kind assistance, and cooperation in participating in this study.

I would be happy to answer any questions you may have about this study. Please call me at 541684.

Sincerely,

Betty Wakou, MS,
Nutritional Sciences Department
Oklahoma State University
Email: wakou@okstate.edu

OR
Child Health Development Centre,
P. O. Box 6717, Kampala
Telephone: 541684

APPENDIX J

SURVEY FOR HEALTH CARE PROVIDERS

Healthcare Personnel Survey

The information in this form, which would permit identification, will be held in strict confidence and will be used for purposes stated for this study. Please answer all questions that apply to you. The questionnaire will take you about 10 minutes to complete.

1. Below is a list of items that women may need advice on. Please tell us how often you include this advice when working with pregnant women.

Directions: Please indicate the type of advice you include in your procedures with expectant mothers by circling the appropriate response

1 No 2 Rarely 3 Sometimes 4 Usually

Do you advise	No	Rarely	Sometimes	Usually
a) What foods a pregnant woman should eat during pregnancy.	1	2	3	4
b) Eating 'mumbwa'/clay is good for the pregnancy.	1	2	3	4
c) Drinking alcohol can harm the mother's health.	1	2	3	4
d) Eating 'mumbwa'/clay can positively affect pregnancy outcome.	1	2	3	4
e) Drinking alcohol during pregnancy can harm the baby	1	2	3	4
f) Poor eating habits during pregnancy can negatively affect pregnancy outcome.	1	2	3	4
g) Eating 'mumbwa'/clay and/or other nonfood substances can affect how much food a pregnant woman eats?	1	2	3	4
h) Eating 'mumbwa'/clay can harm pregnancy outcome.	1	2	3	4
i) To cut down or avoid eating 'mumbwa'/clay.	1	2	3	4
j) To cut down or stop consuming alcohol	1	2	3	4

2. Indicate by placing a check (√) by the most prevalent issues you meet in working with pregnant women.

	Check
a). Pregnant women who practice of eating 'mumbwa'/clay.	
b). Pregnant women who eat too much 'mumbwa'/clay.	
c). Pregnant women who consume alcohol.	
d). Pregnant women who use illegal drugs (marijuana, cocaine, crack, qat)	
e). Pregnant women who are not aware of the effects of alcohol consumption	
f). Pregnant women who eat poorly during pregnancy.	
g). Pregnant women who gain too little weight gain	
h). Pregnant women who are not aware of the seriousness of low birth weight babies.	

3. Please list any other problems related to nutrition not addressed in the above list that you believe would benefit this population.

_____

_____

4. Describe any problems that **hinder** you as a healthcare provider in working with expectant mothers?

_____

_____

_____

_____

5. In which type of community do you live? **(Check one)**

1 □ Rural 2 □ Town 3 □ Suburb 4 □ City

6. How old were you on your last birthday? _____

7. What is your job specification? _____and Title _____

8. Which of the following describes your employment status at this center? **(Check one)**

1 □ Employed full-time

2 □ Employed part-time

3 □ Other_____ Please specify.

9. What is the highest schooling you attained? **(Check one)**

1 □ Secondary □ 1 □ 2 □ 3 □ 4	5 □ Public Health
2 □ High School □ 5 □ 6	6 □ Graduate School
3 □ College Graduate	7 □ Medical School
4 □ School of nursing	8 □ Other_____ Please specify.

10. Name the institution and country where you received your training. _____

Tell us if you wish what is the greatest concern to you about pregnant mothers or the field of health in Uganda.

_____

_____

_____

If you would be interested in the results of my research, please check here ( ) and write your name and address on the envelope provided.

11a). Do you believe that there are benefits to a pregnant woman consuming alcohol? _____
Please explain _____

_____

11b). Do you think that pregnant women believe that alcohol consumption has benefits? _____
Please explain _____

_____

If you would be interested in the results of my research, please check here ( ) and write your name and address on the envelope provided.

Thank you for your time!!

APPENDIX K

HEALTH CARE PROVIDERS QUALITATIVE RESPONSES

Table 1. Nutrition Related Problems Identified by Obstetricians (N=21)

Pregnancy nutrition (10)	o How to eat in early pregnancy when they have severe vomiting or hyper emesis gravid rum, or when they have severe indigestion/acid reflux (2). o Role of nutritional supplements in pregnancy. I have personally noted some mothers don't consider iron/folic supplements important (2). o Not eating a balanced diet. Lack of protein/vitamins in foods (2). o Pregnant women who do not know nutritive diet, what foods provide what? o Role of high vitamin foods especially fruits, vegetables, is not well appreciated by many of the clients. o Affordability of the food regimens we often advise. o Eating foods, which contain iron and folic acid.
Cultural traditions (4)	o Taboos concerning feeding habits in some tribes (2). o Cultural norms prohibiting women/girls from eating pork, chicken, eggs, etc o Some pregnant women eat red soil especially when it starts raining and which can predispose to hookworms.
Poverty (2)	o Economic empowerment of women. o Eliminating poverty.
Ill health	o Chronic ill health e.g. HIV/AIDS.
Maternal outreach programs	o Antenatal outreach programs should be further strengthened to promote maternal and child health.

Table 2. Obstetricians' Perceptions of Pregnancy Concerns (N=21)

Low education (6)	o Education of the girl child. o Economic empowerment of all women to avoid the rampant teenage pregnancies and poor health of most pregnant women. o Lack of health education. o Illiteracy among women. o Pregnant mothers' level of education. o Women empowerment in terms of decision-making and financial support.
Poor ANC attendance (5)	o Very few mothers attend ANC and they often report late in labor with complications of labor. o Most of the mothers book ANC when it is too late an results into few visits. o Most of the pregnant mothers don't appreciate the iss ANC as being helpful to them and their babies hence attend when they cannot when they should. o Poor attendance of ANC. o Unintended pregnancies.
Maternal morbidity and mortality (4)	o High maternal and perinatal morbidity and mortality o The greatest concern is the increasing level of maternal and child mortalities due to health conditions that can be fully dealt with. o Mother to child transmission of HIV. o Poor health of mother and their children.

Table 2. Continued.

Institutional issues (3)	o No a lot has to be addressed in Uganda reproductive health matters especially institutional concerns. o Health in Uganda as in lack of facilities, personnel promotion, remuneration and opportunity for further training. o The quality or care needs rushed revamping to be able to reach near that of developed countries. So that maternal mortalities decrease and people live not only looking after children who are sick but also have leisure.
Inadequate supplies (2)	o Lack of provision of emergency obstetric facilities in rural areas. o Lack of adequate facilities in place.
Poverty (2)	o Poverty among women. o Pregnant mothers' poverty.
Time and patient overload	o The number of mothers vs the number of doctors caring for them. It leaves no adequate time to talk with and teach each individual mother adequately.

Table 3. Obstetricians' Opinions to Hindrances to Effective Healthcare Delivery to Pregnant Women (N=21)

Patient overload and time (10)	o Big numbers of mothers who attend ANC. o Clinics are overwhelmed by numbers of mothers. o Heavy ANC clinic about 300 clients, leading to limited time to discus with patient. o I am not hindered as such but the time spent with one of them is too little for health education. o I don't give enough time to mothers expecting due to the fact that they are so many yet the doctors are so few. o Patient overload/Work overload. o The number of mothers is too high vs the hours to attend to them. o The workload is too much hence asking mothers about their nutritional habits may be difficult. o There are too many mothers per doctor in each ANC visit and this hinders quality health care o Too many patients with limited time to provide individualized health education.
Time (4)	o Lack of my capacity to address effectively their state of economic poverty which influences every major aspect of pregnancy management. o Time. o Time to discus issues, o Insufficient investigation capacity, e.g. routine hemoglobin measure.
Communication barriers (3)	o Most of the antenatal mothers in these several wards can just come and lie on the couch without saying a word including not saying their complaints. o Communication at times is difficult. o Language barrier.

Table 3. Continued.

Cultural beliefs (3)	o As customs and traditions. o Deeply seated cultural beliefs concerning pregnancy e.g. mumbwa. o Cultural beliefs, which some mothers hold strongly.
Illiteracy (3)	o Too much illiteracy of the mother. o Illiteracy. o Illiteracy, some mothers need more that 3-4 times of ANC to understand some issues concerning pregnancy.
Inadequate supplies (3)	o Lack of equipment (2). o Shortage of drugs.
Late ANC attendance	o Coming late to attend ANC usually > 34 weeks.
Poverty	o Poverty.
Poor access to health	o Access to health facilities is difficulty for the mothers.
Non-continuity with patient	o Mothers are not regularly seen by the same doctor and hence breakdown of communication.
Lack of maternal outreach programs	o There no programs in place to help educate women in the communities.
Maternal ignorance	o Most of them are ignorant and only seek modern health care as an option to traditional medicine. Hence they come when they are very sick and some in irreversible states.

Table 5. Obstetricians' Beliefs Perceived Benefits of Maternal Alcohol Consumption in Pregnancy (N=21)

No benefits (12)	o No benefits. (9) o I highly doubt that they are sure. o Not to my knowledge. o Most people who take alcohol do it excessively and then all it does is harm even those who take little derive no benefits.

Infant, maternal, and family effects (5)	o Alcohol consumption in pregnancy results in LBWs (2)
	o As far as the literature I have come across is concerned there is no benefit of alcohol to a pregnant woman that I have come across.
	o Excessive drinking is associated with
	  o growth retardation and structural defects (fetal alcohol syndrome).
	  o It is a scientifically proven that there is a disadvantage/harm to unborn baby (3)
	o Disadvantages to the family (2)
	o Disadvantages to the mother and family.

Benefits	
Increased appetite (3)	o Small amounts have a stimulating action and enhance appetite resulting in adequate food intake and improved nutrition during the pregnancy.
Psychosocial/ Good feeling (2)	o Occasional (once/month) consumption of small amounts of weak alcoholic beverage does no harm and may aid relaxation. Stopping alcohol intake could cause unnecessary stress.
Socialization	o Social drinking during pregnancy has no problems.

Table 5. Continued.

Avoid	o	No. I feel nutritionally and otherwise women should completely avoid alcohol and whatever nutrients acquired through alcohol can be obtained by proper diet.
	o	
Financial misuse	o	The woman may use most of the money on alcohol instead of good food.

Table 6. Obstetricians' Perceptions of Maternal Beliefs about Alcohol Consumption in Pregnancy (N=21)

No benefits (10)	o No. I don't think they think it has benefits. (3) o No. Because even these who take will most times say they don't meaning that they believe it is not right or proper to take alcohol. o To my knowledge most believe it is detrimental to pregnancy. o From interaction with pregnant women many avoid alcohol during pregnancy because they think alcohol harms the baby, **although they do not know how.** o No. Many of the clients I have met relate alcoholism with socio-medical-economical problems. o No. Most women do know that alcohol is not good in pregnancy. What they don't know is why and hardly have I come across any mother taking alcohol in pregnancy. o No. They don't believe either. Those who drink in Uganda are just social drinkers; there is no serious concern of pregnant women alcoholics in Uganda. o No. This is because most of the people in the community are used to seeing problem drinkers and think anybody who drinks gets drunk hence could be harmful to a pregnant mother.
Alcohol benefits (6) Good infant skin (2)	o A few mothers believe that it lightens the skin of their babies. o Some mothers take beer after labor to reduce after birth pains.

Table 6. Continued.

Lack of knowledge about effects (3)	o Most women don't even know alcohol effects. o Although they do not know how. o What they don't know is why.
Low presence pregnancy alcohol intake (3)	o Most Uganda women do not consume alcohol in pathological amounts. o The majority of women give up alcohol when they are pregnant. o Culturally drinking among women is unacceptable so very few women drink alcohol.
Addiction problem if drinkers	o Those who take alcohol while pregnant do it because they are addicted and not due to benefits.

Table 1. Nutrition-related Problems Identified by Nurse-midwives (N=32)

Poverty (19)	• Lack of enough funds or poor income due to unemployment (17). • Tenants have no farmland (2).
Poor diet (12)	• Ignorance about what constitutes a balanced diet (4). • Poor diet and loss of energy (4). • Anemia (2). • Low or no source of income to have a balanced diet if not working. • Food aversion during pregnancy.
Lack of knowledge (9)	• Lack of knowledge/Ignorance (7). • Eradicate ignorance among the people by providing community health education about the dangers of poor nutrition (2).
Large family size (7)	• Promote family planning for smaller families and unwanted pregnancy and spacing of children (3). • Big family/Extended families (2). • Unexpected/unwanted pregnancies especially among teenagers should be avoided (2)
Maternal ill health (7)	• Diseases, chronic illnesses and frequent illness e.g. malaria attacks, which are not properly treated and HIV infection that affects nutrition (4). • Low resistance to infection (2). • Worm infestation.
Poor hygiene (5)	• Poor hygiene practices (5).
Weight gain and growth (3)	• Low weight gain. (2). • Growth retardation.

Table 1. Continued.

Dehydration (2)	• Dehydration due to insufficient intake of oral fluids, juice, and water (2).
Culture (1)	• Taboos where pregnant mothers are not allowed to eat certain types of food.
Other:	
Poor ANC attendance	• To attend ANC as early as possible.
Civil strife	• Wars.

Table 2. Nurse-midwives' Perceptions of Pregnancy Concerns (N=32)

Pregnant mothers should be educated on • Pregnancy Nutrition and diet (4) - Nutrition (2), - Have a balanced diet. - Nutrition education. - I wish we could sensitize more by through workshops on nutrition. • Importance of Hygiene (3) - Hygiene and hygiene education (3). • Importance of maternal behaviors of rest (2) • Importance of maternal behaviors of effects of alcohol (3). • Importance of maternal behaviors of use of native medicine (3). • Education information and dissemination (2) - Health education talks must be encouraged down to the grass root (2). - Health education should be encouraged in community. - Health education. - Sensitizing pregnant mothers about all the dangers of pregnancy hence avoiding them.	
Early Sex Education (6)	• Girls should be taught safe motherhood right from primary level, so as to prevent adolescent pregnancies and their outcome. • Family planning to be emphasized for a better standard of living.

Table 2. Continued

Early Sex Education (6)	• Health education should be started right from the grassroots like primary level so that these mothers get pregnant at the right time to prevent VVF fetal and mental mortality rates. • To promote a girl child from childhood.
Low attendance at ANC (6)	• Knowledge of importance of attending ANC (3). • All mothers should attend ANC and deliver from hospital. • Always seek medical attention whenever they are sick. • It is of great concern to me to look after pregnant mothers properly during that pregnancy and advise them what to do.
Decrease morbidity and mortality (2)	• Reduction of maternal and infant morbidity and mortality rate. • • To attain health of mother during pregnancy, labor and pueperium and a live healthy baby and healthy nation.
Spouse participation	• Husbands should be encouraged to come with their wives to hospital ANC.
Maternal illiteracy	• Most mothers are illiterate.

Table 3. Nurse-midwives Opinions to Hindrances to Effective Healthcare Delivery to Pregnant Women (N=32)

High Patient load (16)	• A large number of expectant mothers (10). • The number of patients is still high compared to manpower/health care providers (3). • Mother are too many for unit area space (working space is not enough) (3).
Inadequate facilities (7)	• Lack of adequate facilities (healthcare centers) for health education demonstration and space for mothers to sit (7).
Inadequate transportation (7)	• Lack of transport to facilities (healthcare centers) and to rural areas (4) • Lack transport and communication to go to community to meet the pregnant mothers (3).
Ignorance (6)	• Majority being ignorant about usefulness of ANC and health education (3). • Ignorance among many people to listen to advice from a health care worker. • At times mothers neglect the health education talks thus fail to make necessary preparation. • Some mothers are not interested.
Low manpower (6)	• Doctors and midwives are few compared to the large number of mothers, affects quality of care given (6).
Communication barriers (5)	• Poor communication as in language barrier (5).
Cultural traditions (5)	• Most mothers take their culture behaviors most important than what we teach or advise them especially on native drugs and what to eat (3). • Cultural beliefs (2).

Table 3. Continued.

Poverty (4)	• Poverty where mothers cannot manage to attend as they are supposed to because of not having money for transport (2). • Poverty, mothers are too poor to afford balanced diet (2).
Poor antenatal care (ANC) attendance (4)	• Poor and late turn up of mothers fro ANC (3). • All pregnant mothers should attend ANC to be knowledgeable about diet.
Inadequate materials and equipment (3)	• Instruments in labor ward inadequate/Lack of equipment e.g. gloves, beds, and fetal stethoscope (2). • Lack of teaching materials.
Low availability of supplies	• Drugs not enough •
Poor access to services (2)	• Poverty where mothers cannot manage to attend as they are supposed to because of not having money for transport (2). •
Protection against infectious diseases	• Fear of infectious diseases like Ebola and TB.
Nutritional care support	• Providing special nutritional care to pregnant mothers especially to poor mothers.
Poor healthcare quality	• The quality of care is poor due to large number of patients.

Table 4. Nurse-midwives Opinions about Health Institutions in Uganda (N=32)

Increase health facilities (10)	• Health centers should be built in all parishes to avoid mothers moving long distances (3). • The Ministry of Health (MoH) should open up enough health centers (4) • To build maternity centers at a community level so that the referral hospital are not overcrowded. • .The rural health setting should be modified and well equipped in order to take health care nearer to the people and avoid overcrowding in hospitals. • Expand enough space in hospital in ANC.
Increase number of community health workers (8)	• More health workers should be trained and sent in other parts of Uganda (communities at grass root levels) to provide health education through seminars to pregnant mothers for improved health and to extend seminars to schools for teens. (5). • The MOH should employ some more midwives and enough transport to go to communities and meet the pregnant mothers who cannot come to hospitals. • Employ more midwives to help pregnant mothers in rural areas (2).
Protective materials (2)	• The MOH should provide us more preventive materials so that we should protect us from serious diseases e.g. HIV (2).
Teaching materials	• Supply more teaching materials to hospitals and health units
Inadequate equipment	• Inadequate equipment.

Table 5. Nurse-midwives Beliefs about the Benefits of Alcohol Consumption in Pregnancy (N=32)

Fetal and maternal medical effect (Reasons given for no benefits of alcohol use) (29)	• Alcohol intake by pregnant mothers produce or deliver babies which are small for dates (11) • Alcohol is so harmful to the o Infants' general health (6). o Mother's general health (4). • Alcohol affects fetus like mental retardation resulting from brain damage (4). • Mother may o Lose weight (2). o Have problems during delivery - big babies-difficult to push. o Not respond easily to anesthesia in case of surgery.
No benefits (20)	• No benefits (20). •
Poor diet (17)	• Because if a mother takes alcohol she will not eat enough food which will result into uterine fetal retardation (3). • Pregnant mothers do not save their little income they have for their nutrition. They intend to drink the money they have (3). • Pregnant woman may not cook food and this will lead to poor nutrition. • Sometimes loss of appetite, leads to anemia and LBW and less resistance to infection (5). • Alcohol is expensive and mothers may fail to eat when they over drink. • Alcohol has serious effects to maternal nutrition that can result in lowered immunity. • When a mother takes alcohol (3) o it affects the baby's weight and o it affects her income, because it is expensive and o the mother loses appetite for food.

Table 5. Continued

Physical injury (Reasons given for no benefits of alcohol use) (6)	• As a result the pregnant mothers may fall down and harm herself (fracture bone, get antepartum hemorrhage), and the fetus in the uterus (lead to abortion and premature birth) (5). • Get into fights with their husbands APH, IFVD etc.
ANC nonattendance (3)	• Pregnant women that drink tend to forget to attend the ANC and may end up delivering at home (2). • Mother gets no time to attend ANC.
Benefits	• A pregnant mother who consumes alcohol may benefit by having a peace of mind and good rest (1).

Table 6. Nurse-midwives' Perceptions of Maternal Beliefs about Alcohol Consumption in Pregnancy (N=32)

	No (2)
Clean baby / good skin (16)	• Some pregnant mothers think that when they take alcohol they deliver clean babies (waragi) (8). • Some think that alcohol taking leads to pregnant mothers to deliver babies with a very nice skin with no defect (3). • When they take alcohol, they believe that they will deliver a clean baby without vermix (2). • Yes. They believe that this makes the baby clean and the baby will be bright when it is born. • They think that taking alcohol do clean their babies in-utero, whereby they come out very clean without liqiour, meconum, etc • They think the baby is very clean at delivery and fat.
Emotional well being/Good feeling (12)	• Some just drink to reduce worries so as to get sleep (5). • Some believe they feel well after taking alcohol. Some times it is hormonal (3). • To pass time • They feel easy, happy, and no abdominal discomfort. • They think they get strength, they don't think a lot- so they rest. • Many of these mothers always think it is normal for it relaxes their mind. • They drink so that they may forget their worries.
Quick and easy delivery (7)	• Alcohol quickens labor and delivery (7)
Increased baby size (5)	• Pregnant mothers believe that when they take alcohol (beer) will help them to deliver fat or big babies (5).

Table 6. Continued

Social leisure (3)	• They drink just for pleasure, to pass leisurely time with others (2). • Peer pressure.
Pain relief (2)	• Alcohol always relieves them from the after pains. • They believe that alcohol lessens labor pains.
Prestige	• No. They drink as a sign of prestige.
Nutritional benefits	• Yes, they think it is highly nutritious.
Addiction	• No. Most women do not know the danger of alcohol but they take it as their routine if a mother is a drinker.

#7

VITA

Betty Ann Namarome Wakou

Candidate for the Degree of

Doctor of Philosophy

Thesis: CONSUMPTION OF CLAY, HERBS AND ALCOHOL BY WOMEN OF CHILDBEARING AGE IN KAMPALA, UGANDA

Major Field: Human Environmental Sciences

Biographical:

Personal Data: Born in Mbale, Uganda (E. Africa), the daughter of Rev. Jonah and Dorothy Wegoye. Married to Nicholas Wakou with two daughters and a son.

Education: Graduated from Tororo Girls High School, Tororo, Uganda in 1982; received a Diploma in Education (with Home Economics and Biology) and a Bachelor of Education (with Home Economics) from Makerere University, in Kampala, 1984 and 1992, respectively; received Master of Science degree in Nutritional Sciences from Oklahoma State University in December 1998; completed the requirements for the Doctor of Philosophy degree in December 2002.

Professional Experience: Teacher, Mt. St. Mary's Namagunga Secondary School, 1984 to 1989; Assistant lecturer, Institute of Teacher Education, Kyambogo, 1992 to 1996. Uganda National Examinations Board Examiner, 1995 to 1996; Graduate Teaching and Research Assistant, Department of Nutritional Sciences, Oklahoma State University, 1998-present.

Professional Memberships: Member of the Africa Home Economics Association, Uganda Home Economics Association, Uganda Home Economics Teachers' Association, Society for Nutrition Education, Kappa Omicron Nu Society, American Association of Family and Consumer Sciences.